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ABSTRACT

In Michigan, a school-based bicycle helmet intervention program has been developed to increase the prevalence of helmet use among middle/junior high school students. The intervention involved approximately 3,100 students and their parents. The school-based intervention component of the project is the focus of this report. A two-tier intervention strategy was implemented in school systems in Oakland County (Michigan) to determine what level of intervention exposure motivates behavior change in this age group. Findings from the intervention provide useful knowledge to design and implement effective and efficient bicycle helmet behavior change programs. The main body of the document describes and evaluates the pilot program. Eight appendices incorporate: (1) abstracts of helmet testing study; (2) Oakland County population demographics; (3) school selection criteria; (4) intervention protocols; (5) letter to parents included with free helmets; (6) teacher's curriculum guide; (7) breakdown of telephone sample; and (8) pre- and post-intervention survey questionnaire. Two posters and three pamphlets are included with the report. (Includes 45 references.) (LL)

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# Increasing
# BICYCLE HELMET USE
## In Michigan

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Michigan Bicycle Helmet
Advisory Committee

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*"Use your head to protect your brain."*

*Mark Widome, M.D., M.P.H.*
*Pennsylvania State University*
*College of Medicine*

# INCREASING BICYCLE HELMET USE IN MICHIGAN

## A School-Based Intervention Pilot Program

## Evaluation Report

by Patricia K. Smith, M.S.

**MICHIGAN BICYCLE HELMET ADVISORY COMMITTEE**
**March, 1991**

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Lastly, we would like to express our deep gratitude to the Detroit Red Wings organization for their extensive cooperation and assistance in the production of the public service announcement for the program. Special thanks are extended to Joe Kocur, Dave Barr, John Chabot and Jacques Demers.

*"Wear a helmet. It's inconvenient, but so is not being able to think or talk because your head has been pounded into jelly."*

*Richard Ballantyne*
*Richard's New Bicycle Book*

## EXECUTIVE SUMMARY

Bicycling is viewed by both parents and children as an enjoyable and safe recreational activity. However, in Michigan in 1989, 32 bicyclists were killed and thousands were injured. Head or brain trauma accounts for at least 75% of fatal injuries among bicycle riders, yet fewer than 5% of today's young bicyclists wear a helmet when riding. In Michigan, only 2% of children ages 5 to 14 years ever wear a helmet, even though bicycle helmets have been shown to reduce the risk of head and brain injury in a bicycle crash by at least 85%.

Therefore, the Michigan Department of Public Health, under the leadership of the Michigan Bicycle Helmet Advisory Committee, as one part of "The Michigan Pilot Project to Reduce Head Injury Among Children Involved in Bicycle Crashes" developed a school-based bicycle helmet intervention program. The objective of this intervention was to increase the prevalence of bicycle helmet use from $\leq 2\%$ to $> 10\%$ in one year among the intervention population of middle/junior high school students.

The intervention involved approximately 3,100 students and their parents in a total of six schools in Oakland County, Michigan. The two levels of intervention examined in the program were designated as "low" intensity (LI) and "high" intensity (HI) based on the number of different components utilized, the directness of message delivery, cost, and ease of implementation. Each level had one rural, urban, and suburban school assigned to it. The students' short-term behavior change and changes in parental behavior and attitudes were evaluated through pre- and post-intervention telephone surveys of a random sample of the parents from each of the participating schools.

Of the 1,240 early adolescents in this study about whom parents reported bicycle riding frequency, 99% rode a bicycle at least occasionally. Just over 5% of the bicycle riding students owned helmets pre-intervention and parents reported that 2% of the bicyclists wore a helmet at least 50% of the time when riding.

Helmet ownership among bicycle riding students increased to 18.5% at post-intervention. Almost all of this increase was accounted for by the six-fold increase in helmet ownership by students in the HI schools due to the large helmet giveaways that were part of the HI intervention.

In absolute numbers, there was an increase in overall helmet wearing pre- to post-intervention. There was a significant difference between the LI and HI schools in the proportion of all bicycle riding students reported by their parents to be wearing a helmet at

least 50% of the time at post-intervention. However, even though the number of helmet-owning students in the LI schools did not change pre- to post-intervention, the proportion of students in those schools who already owned helmets wearing them at least half the time increased significantly during the intervention time period. In contrast, although more students overall were reported wearing helmets in the HI schools than in the LI schools at post-intervention, in the HI schools proportionally fewer helmet-owning students at post-intervention were wearing their helmet at least half the time than at pre-intervention.

In post-intervention households where no child owned a helmet, either purchased or free, parents of children in the HI schools were more likely than parents of children in the LI schools to report that this was because their child[ren] would not wear a helmet. In the post-intervention survey, almost 40% of the LI parents and over 30% of the HI parents still believed that their child[ren] did not need a bicycle helmet. This was even though over two-thirds of these parents felt it was likely or extremely likely that their child[ren] would receive a head injury if they were involved in a bicycle crash when not wearing a helmet.

The following recommendations for increasing the usage of bicycle helmets by Michigan's young people are based on the findings from this report and prior research conducted in this area.

## Recommendations

- It is recommended that a plan be developed for the statewide dissemination of a bicycle helmet program. This program should incorporate the successful elements of the Michigan pilot project with elements of other successful programs and should be community-based.

- It is recommended that MDPH staff, in collaboration with members of the Michigan Bicycle Helmet Advisory Committee, design, conduct and evaluate a training program on community coalition building and the promotion of bicycle helmet use.

- It is recommended that the Bicycle Helmet Advisory Committee and the Michigan Department of Public Health work with the Department of Education, parent-teacher associations, and the Michigan School Principals Association to investigate the feasibility of designing rules which would require students to wear bicycle helmets when riding on school property.

- It is recommended that the schools which participated in the pilot project be revisited in the spring of 1992 and that an assessment of helmet ownership and use be made at that time. This is because the combination of the school calendar, summer vacation, and grant period precluded a long-term follow-up study as part of the original project.

- It is recommended that the Advisory Committee and the Michigan Department of Public Health staff work with schools throughout Michigan to insure that their health education curriculum contains a focus on head injury prevention and helmet use in sports and recreation. One way that this could be accomplished is through the Michigan Model for School Health Education.

- It is recommended that members of the project staff present the findings from this program to the Michigan State Safety Commission and seek the Commission's counsel and support in promoting the issue of bicycle helmet use on a statewide basis.

- It is recommended that the Michigan Bicycle Helmet Advisory Committee seek recognition as a working sub-committee of the Michigan Spinal Cord/Traumatic Brain Injury Committee, as a means of facilitating their continued work on a statewide bicycle helmet program.

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*"If 450 children died each year on the football playing field and thousands more were treated in hospital emergency rooms, parental outcry would quickly result in a modification of the game, if not its actual ban."*

*Frederick Rivara, M.D., M.P.H.,*
*Harborview Injury Prevention*
*and Research Center*

## INTRODUCTION

Without a doubt, bicycling is currently one of America's favorite recreational pastimes.[1,2] In Michigan during the bicycling season, over 80% of the children between the ages of 5 and 14 ride a bike at least twice a week.[3] Bicycling provides children with an excellent form of exercise, and with mobility and a sense of freedom they might not otherwise have. Unfortunately, most parents and children think of a bicycle as a toy and not as a first vehicle, one which can lead to serious injury or even death.

Head and/or brain injuries account for at least 75% of fatal injuries among bicyclists.[4] In one study, 81% of the bicycling fatalities were attributable to head/brain injury.[5] Bicycle helmets have been strongly recommended as a way to prevent and reduce head and brain injuries as a result of a bicycle crash.[6-10] Helmets protect the head and brain in a crash by slowly decelerating the brain after impact and by protecting the skull from fracture.[11] Thompson and Rivara's landmark study of the effectiveness of bicycle helmets demonstrated that there was an 85% reduction in the risk of head injury and an 88% reduction in the risk of brain injury in a crash when a bicycle helmet was used.[12]

Researchers report, however, that less than five percent of children and adolescents wear helmets while bicycling.[13-17] An observational study by Weiss found less than **two** percent of elementary and senior high students and **no** junior high students wearing helmets while riding their bicycles.[18] Increasing the prevalence of helmet use among young people is a vital step in reducing the risk of serious and fatal head or brain injuries resulting from bicycle crashes. If helmets reduce the incidence of head and brain injury by at least 85%, in 1989 they potentially could have saved 20 lives in Michigan and over 500 lives nationwide.

### Scope of the Problem

Injuries resulting from bicycle crashes are an important cause of childhood morbidity and mortality in the United States. Approximately 70 percent of those injured or killed nationwide in bicycle crashes are under the age of 15.[7] In 1988, 439 children between the ages of 5 and 17 years were fatally injured nationwide while riding bicycles.[19]

Both in the U.S. and in Michigan, bicycle fatalities were among the top five causes of injury-related death among 10-14 year olds for the six years from 1980-1985.[20] In Michigan for those years, 66% of all bicycle-related fatalities to children ages 0-14 years were in the 10-14 year age group. Among these early adolescents, only motor vehicle occupants injuries, pedestrian injuries and homicides accounted for more injury deaths.[21]

In Michigan in 1989, there were thirty-two bicyclists killed and 3,018 injured in traffic-bicycle related crashes reported to police.[22] Almost one-third (n = 10) of all the fatalities were among 10-14 year olds and 34% of the injuries (n = 1,029) were within this age group (see Tables 1 & 2). Males ages 5-9 and 10-14 years were the most likely age-sex groups to be admitted to a hospital for bicycle-related injuries.[23] As the data in Table 2 illustrate, well over twice as many males as females in these age groups sustained bicycle-related injuries in traffic incidents in 1989. Among 5-19 year olds, boys were almost three times more likely to be injured than girls in reported bicycle incidents and three times more likely to be killed than girls. In the 10-14 year old age group, boys were four times as likely to be killed as girls.

Bicycle incidents reported to the authorities are typically those which involve motor vehicles. The most severe injuries and almost all fatalities tend to occur in collisions with motor vehicles. However, crashes with motor vehicles account for 20% or less of bicycle-related injuries.[24-26] Additionally, it has been estimated that overall only 2%-8% of all bicycle-related incidents resulting in non-fatal injuries are reported to the police.[27,28] The possibility exists, therefore, that just among early adolescents ages 10-14 there were over 12,800 young bicyclists injured in Michigan in 1989.

Head injury is involved in a high proportion of bicycle crashes and is the cause of many of the fatalities.[5,29-33] Head trauma also occurs frequently in serious non-fatal bicycling crashes. For the survivors of even mild and moderate head injuries, the sequelae can be profound, disabling and long lasting.[34-37]

## The Michigan Bicycle Helmet Project

The importance of promoting bicycle safety among the general public is gaining recognition. In Michigan, the 1987 Governor's Conference on Traffic Safety included bicycle safety in its priority recommendations.[38] The conference emphasized that encouragement of the use of bicycle helmets and other protective clothing should be incorporated into a uniform statewide traffic safety campaign, and that all elementary school children should be ensured of receiving "continuing formal instruction on pedestrian, bicycle and ORV safety." Also, the U.S. Department of Health and Human Services has set the increase of helmet use to at least 50% of all bicyclists as one of their safety-related objectives the the Year 2000.[39]

In December, 1988, the Michigan Department of Public Health, Center for Health Promotion, Health Surveillance Section, received an injury control incentive grant from the Centers for Disease Control (CDC) to develop and carry out "The Michigan Pilot Project to Reduce Head Injury Among Children Involved in Bicycle Crashes." The combination of studies proposed under the Michigan Bicycle Helmet Project focused on: 1) evaluation of

**Table 1. Number of child bicyclists killed in bicycle crashes reported to police in Michigan in 1989.**

| | | *sex* | |
|---|---|---|---|
| *age* | *total* | *male* | *female* |
| 5 - 9 | 6 | 3 | 3 |
| 10 - 14 | 10 | 8 | 2 |
| 15 - 19 | 4 | 4 | 0 |
| Total | 20 | 15 | 5 |

SOURCE: MICHIGAN STATE POLICE

**Table 2. Number of children injured in bicycle crashes reported to police in Michigan in 1989.[a]**

| | | *sex* | |
|---|---|---|---|
| *age* | *total* *(bicyclists only)* | *male* | *female* |
| 5 - 9 | 579 (576) | 433 | 146 |
| 10 - 14 | 1034 (1029) | 746 | 288 |
| 15 - 19 | 509 (492) | 380 | 129 |
| Total | 2122 (2097) | 1559 | 563 |

SOURCE: MICHIGAN STATE POLICE

[a] Includes 25 children who were injured in incidents involving bicyclists, but who were not bicyclists themselves (ie., motor vehicle operators, pedestrians, motor vehicle passengers).

helmet use by young people in Michigan and parental attitudes toward bicycle helmet use and, 2) the reduction of the incidence and severity of head injuries resulting from bicycle crashes. The results of the intervention and investigative activities carried out within the framework of the project should contribute significantly to Michigan's ongoing development of a comprehensive head injury control program by helping to alleviate one of the most preventable causes of head injury.

In order to assure the maximum possible protection by a bicycle helmet from head and brain trauma, it is imperative that the helmet undergo rigorous biomechanical testing to ascertain its effectiveness under adverse and diverse conditions. Wayne State University, as one part of the Michigan Bicycle Helmet Project, conducted such biomechanical tests of a variety of readily available youth-sized bicycle helmets (see Appendix A for abstracts of the two studies conducted under this grant).

The school-based intervention component of the Michigan Bicycle Helmet Project, which is the focus of this report, was developed to explore factors which influence and motivate students of middle school age (10-14 years) to adopt a healthy lifestyle behavior - i.e., bicycle helmet use. A two-tier intervention strategy was implemented in school systems in Oakland County, Michigan, to determine what level of intervention exposure, if any, motivates behavior change in this age group. The findings from this intervention could provide programs in Michigan and around the country with useful knowledge to design and implement effective and efficient bicycle helmet behavior change programs targeted toward middle school children.

*"The ideal therapy for head injury is its prevention."*

*Derek Bruce, M.D.*
*Director, International Pediatric Neurosurgery Institute*

## DESCRIPTION OF THE SCHOOL-BASED INTERVENTION PROGRAM

The objective of this pilot school-based intervention was to increase the prevalence of bicycle helmet use from $\leq 2\%$ to $> 10\%$ in one year among a group known to be at high risk for bicycle-related injury--specifically youth ages 10 thru 14 years. The intervention and evaluation process was designed to identify which, if any, components of an intervention would be most effective in increasing bicycle helmet usage behavior among this age group. The intervention involved approximately 3,100 middle school students and their parents in a total of six schools in four different school districts in Oakland County, Michigan. The two levels of intervention used were designated as "low" intensity and "high" intensity based on the number of different components utilized, the directness of message delivery, cost and ease of implementation. The students' short-term behavior change was evaluated through pre- and post-intervention telephone surveys of a random sample of the parents from each of the participating schools.

### Target population

Middle school youth, especially boys, are the most vulnerable age group in Michigan in terms of bicycle-related morbidity and mortality (see Tables 1 & 2).[22] In past bicycle helmet projects conducted elsewhere this age group has been considered a difficult one in which to foster behavior change.[40,41] Therefore, these earlier projects, including a national program in Sweden reported by Bell & Drakenberg[42], aimed their message at the younger elementary school children and their parents. Younger children, although found to be reluctant to wear helmets, were seen as more compliant in terms of behavior change and more readily influenced by their parents and other authority figures.

These previous projects readily demonstrated that significantly increasing helmet usage among younger children is feasible. However, little is known about what might effectively motivate change in bicycle helmet usage behavior in early adolescents, although multiple elements in these earlier projects applied to this age group as well as the younger children. Increased bicycle helmet use among 10-14 year olds would not only reduce morbidity and mortality related to head injury in this high risk group, but helmet-wearing early adolescents could provide excellent and effective role models for younger children.

### Site selection

**Oakland County.** Oakland County, Michigan, was selected as the intervention site because of the adequacy of the population size, especially of 10 to 14 year olds. Additionally, the county, located in the southeastern corner of lower Michigan, is a blend of urban,

suburban, and rural communities offering a variety of physical environments for bicycling and a wide range of socio-economic populations. The 1988 population in Oakland County was estimated at 1,052,475 persons (see Appendix B). Twenty-eight percent of the population was under the age of 20; 74,741 (7.1%) were children aged 10 to 14 years. Eight percent of the population was made up of African Americans and other minority racial groups.

**Schools.** (see Appendix C for selection criteria) One of the goals in any health promotion program is to obtain the "buy-in" of those groups most interested in the target population. This increases the probability that the program will be continued. Involving schools, therefore, is a logical choice when a program focuses on school-age youth. Middle schools were chosen for this project because, although some ten year olds might be in fifth grade and some fourteen year olds in ninth grade, the majority of youth ages 10-14 attend sixth through eighth grades. There are twenty-eight school systems in Oakland County. Initially, it was planned to concentrate school recruitment efforts on the large, urban Pontiac school system because of its large number of middle schools (5) and larger minority student population than other schools in the county. Unfortunately, during the recruitment time period there was significant concern over an anticipated teachers' strike against the Pontiac school district. Because recruitment had to take place within a specific time period efforts were transferred to out-county school districts.Socio-economic status--which can affect helmet purchase and helmet use--was controlled for by implementing each of the two intervention levels in three schools: one urban, one suburban, and one rural middle school. This also allowed for control of the possible effect of different bicycling conditions.

Two of the twenty-seven school districts outside of Pontiac--Birmingham and Bloomfield Hills--were eliminated from consideration because of the extremely high average per capita income in those communities. Next, those school systems which had implemented the Michigan Model for Comprehensive School Health Education or a similar Oakland County health education program were identified. The Michigan Model is a basic health curriculum aimed at developing positive health attitudes and behaviors in elementary and middle school aged children. It was felt that the bicycle helmet intervention would support some of the general injury control elements of the current Michigan Model curriculum and would therefore be more readily received by the faculty. Additionally, schools which had elected to participate in the Michigan Model program had exhibited a commitment to improving the health behaviors of their students. It was believed, therefore, that they might be more receptive to participation in the intervention process.

## Timeframe

Planning and preparation for the intervention took place over the course of fifteen months. Other than the television public service announcement, the actual intervention occurred over one or two days in each school at the end of April, the beginning of the bicycling season in Michigan.

Bicycle riding season is relatively short in Michigan, running typically from May through September. The available window of opportunity to reach the students through the schools at the beginning of the season--when their bicycling interest is peaked--is approximately

four to six weeks. Sufficient time also had to be allowed to complete the pre- and post-intervention activities while working around the school calendars, as well as the schedules of the professional athletes involved in the high intensity intervention.

## Interventions

**High vs. low intensity interventions.** Although somewhat similar in the types of components used (see summary, Appendix D), each of the two levels of intervention used differed in the intensity and directness of message delivery, as well as cost (see Table 3). The primary differences between the high intensity (HI) and low intensity (LI) programs were that the HI intervention included a large helmet giveaway, an all-school assembly featuring professional sports stars, and the use of different program theme than the LI intervention.

Each level of intensity had its own bicycle helmet promotional theme for encouraging the use of helmets among the targeted 10 - 14 year old population. For the LI schools, the theme was "Keep A Head". This slogan addressed the topic of head injury prevention, as well as promoted the idea that bicycle helmet wearers were leaders, not "nerds". This negative "nerd" image is often associated by young people with bicycle helmet use.

In the HI schools the theme "Keep on Winning" was used. This phrase emphasized the positive aspects of wearing a helmet, and also effectively tied into the use of professional athletes as role models, an integral part of the high intensity campaign. It was believed that having recognizable sports stars connected with the campaign who wore helmets "on the job" as well as when bicycling would stimulate the interest, as well as modeling behavior, of the middle schoolers, especially the boys.

Two members of the Detroit Red Wings professional ice hockey team appeared in all written materials and in the television public service announcement (PSA). Another highly recognizable team member and the coach of the team appeared in the school assemblies. Red Wings players were chosen for several reasons: 1) they wear helmets in their professional careers; 2) the average age of the players is early 20's, substantially younger than the other Detroit area professional sports teams; 3) it was projected that the team would have a successful season (unfortunately, they did not) which would enhance their appeal; 4) most Red Wings players do not suffer from the over-exposure which affects some of the stars on the other professional sports teams in the state; and 5) the hockey players selected wore helmets on the ice and while bicycling (an activity which they engage in to keep their legs in shape and build stamina off-season). The coach was a highly visible sports personality, had high source credibility, and was well liked by the public. He could also speak from experience on the issue of bicycle-related injury because his young son had been involved in a bicycle crash the previous year. Lastly, the selection of professional hockey players was opportune because the hockey season was winding down in Michigan at the same time it was necessary to schedule the school assemblies. This meant that these athletes were accessible for public appearances while hockey at the national level was still receiving attention in the local media.

**Table 3. Rating of factors considered in the selection of components for high and low level interventions.**

| *Component [intervention]* | *Criteria* | | | |
|---|---|---|---|---|
| | *cost* | *directness of message* | *ease of implementation* | *ease of replication* |
| 1. discount program [both] | 1 | 1 | 1 | 1 |
| 2. curriculum guide [both] | 1 | 1 | 2 | 1 |
| 3. posters-generic [LI] | 2 | 1 | 1 | 1 |
| 4. student brochures [both] | 2 | 1 | 1 | 1 |
| 5. parent brochures [both] | 2 | 2 | 1 | 1 |
| 6. posters-sports figure [HI] | 2 | 3 | 2 | 3 |
| 7. PSA [both] | 3 | 2 | 3 | 3 |
| 8. assemblies [HI] | 3 | 3 | 3 | 3 |
| 9. helmet giveaway [HI] | 3 | 3 | 3 | 3 |

Cost: 1 = low 2 = moderate 3 = high

Directness of message: 1 = indirect 2 = direct 3 = very direct

Ease of implementation: 1 = easy 2 = moderate 3 = difficult

Replicability: 1 = easy 2 = moderate 3 = difficult

## Components of the interventions[a]

Both at the HI and LI levels, the bicycle helmet usage intervention programs were designed to present the message using several different channels of communication. This follows a basic education model of presenting a message and reinforcing it both aurally and visually.

**PSA.** To lay the groundwork for the intervention program, a 30-second PSA featuring two professional hockey players was designed and produced over a five month period in late 1989 and early 1990.[b] Copies of the PSA were distributed to all Detroit area television stations and cable systems with the request that they be aired starting the first week of April, three weeks before the intervention in the schools A thirty second spot, rather than a sixty second, was selected for the PSA because TV stations would be more likely to donate that amount of air time periodically during the viewing day. The stations were asked to play the PSA primarily during the late afternoon/after school time slot, Saturday mornings, or whenever their demographic data showed the highest prevalence of viewing by adolescents.
The copies of the PSA were personally delivered to the public service director at each station along with a letter explaining the project and reinforcing the request for air time. In addition, letters from the Michigan Secretary of State, the Director of the Office of Highway Safety Planning, and the President of the Michigan Head Injury Alliance were sent to the station directors urging them to provide air time for the PSA. Also, members of the Michigan Bicycle Helmet Advisory Committee were urged to correspond with the TV stations to support airing of the PSA. This reinforcement strategy was employed to further emphasize the broad support for the program. There is tremendous competition for public service air time and it was hoped that the combination of personal appeals, use of well-known area sports celebrities and a request for a less competitive air time slot (i.e., non-"prime time") would improve the probability of having the PSA shown.

Although the PSA was based on the HI theme, it was obviously able to be viewed by students at both intervention levels, as well as some of the parents, since the coverage of the Detroit television stations includes the entire Oakland County area. The PSA was also distributed to the Intermediate School District closed-circuit TV stations so that they could show it in all of the target schools.

Because public service announcements should foster action steps on the part of the viewer, a 1-800- number was provided at the end of the PSA to allow viewers to telephone for

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[a] Approximate costs incurred by various components are given at the ends of the following subsections. These cost would vary in other programs depending on such things as the elaborateness of the particular component, number of copies ordered of printed materials, and use of in-kind talent and services. The figures presented here are only for reference in planning. Average costs for the printed materials include any artwork, printing, and folding.

[b] The PSA was the recipient of two 1991 "ADDY" Awards from the Michigan Advertising Association--the award for the Best PSA-less than 60 seconds and the award for the best PSA original Music Score. Copies of the PSA are available for preview from the Michigan Bicycle Helmet Advisory Committee upon request. A copy of the PSA story board is located in the pocket inside the back cover.

additional information about bicycle helmets. The 1-800- health hotline is an ongoing service run by MDPH, so there was no cost incurred by the program.

PSA Costs: Talent and location expenses - $5,000.00
Video production expenses - $5,380.00
Tape duplication - $15.00@

**Printed Materials.** Printed materials included student and parent brochures and posters (see samples in Appendix E, located in the pocket inside the back cover). All printed materials followed the theme of the specified intervention, "Keep A Head" or "Keep on Winning". The "Keep A Head" artwork was designed by the National Child Safety Council, a member of the Advisory Committee. Artwork for the "Keep on Winning" student brochures and school posters was developed from the PSA by a local professional design company. Original poster designs were pretested with a sample of 10-14 year olds for appeal and clarity of message.

For the brochures, members of the MDPH staff collected all the brochures they could locate from around the country which promoted bicycle helmet use. From these brochures basic elements which fit the Michigan theme and objectives were selected. This served as the core from which the final content was developed. Initial draft copy and graphic elements were reviewed by professional health educators before the final mock-ups were pre-tested with both children of the appropriate age as well as parents of children whose ages were close to those of the target population.

All participating schools were provided with student brochures for every student and enough parent brochures for every household. The student brochures were distributed in class after the assembly, during classroom discussion of helmet use. The parent brochures were bulk mailed by the school in an envelope with the school logo and/or name on the outside and with a cover letter from the principle; in one case the parent brochures were mailed with a scheduled school newsletter. Each school also received fifty posters, with instructions to display them wherever possible in the building during the week of the scheduled intervention. Once the materials were delivered to the schools, the school's coordinator was responsible for seeing that they were distributed as agreed. Posters were also distributed by the project team to all bicycle shops in Oakland County with a request that they be displayed.

Costs: Posters - avg. $0.96@ Student brochures - avg. $0.92@
Parent brochures - avg. $0.78@ (costs include camera-ready art and folding)

**Assemblies.** School assemblies can provide a highly visible, very direct and controlled means for delivery of a message to an entire student body at the same time. The Michigan Bicycle Helmet Project assemblies were presented in the HI intervention schools to approximately 1,400 students. Attendence was mandatory for all students present in school on the day of the assembly. The assemblies consisted of an introduction by the school's coordinator, a general discussion on the consequences of brain injury by the project's principle investigator, and presentations by Sharon Barefoot, president of the Michigan Head Injury Alliance, whose son was brain injured in a bicycle accident, as well as by the

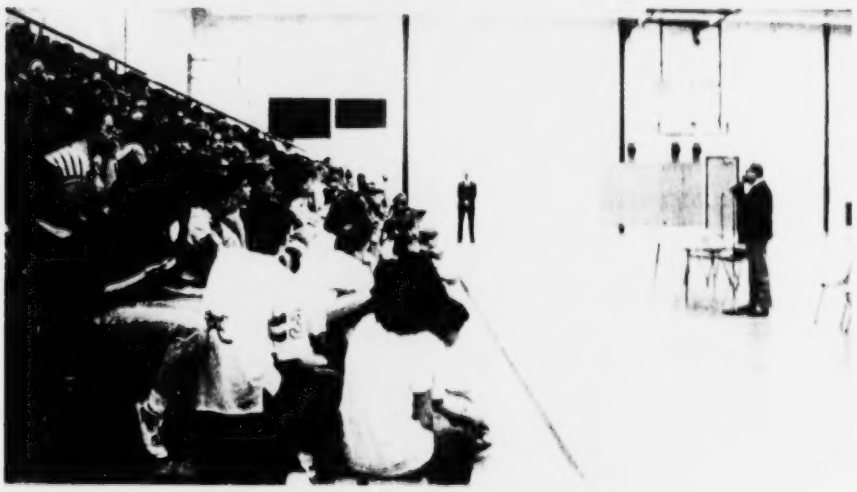
head coach of the Detroit Red Wings, and a Red Wings player. The entire assembly lasted approximately 25 minutes. Afterwards, there were opportunities for questions and answers, and both the coach and the player autographed helmets and posters.

Assembly cost: Production and appearance support - $3,500.00

**Helmet discounts and giveaways.** Cost has often been cited as a barrier to parents providing their children with bicycle helmets. Therefore, increasing accessibility to bicycle helmets for the students and their families was an important part of the school-based intervention.

In both the LI and HI schools, three coupons which provided discounts on three different brands of helmets--Bell, Troxel, and Masterlite--were included in the mailing to all of the parents. The Troxel helmets were offered at 40% off the regular retail price and the Masterlite from Hedsite was offered at $25.00. Both had to be ordered through the mail directly from the manufacturer. For the Bell helmets, a coupon was provided which could be used for $10.00 off any Bell helmet at either of two specified Bell dealers in Oakland county.

Two hundred free helmets were provided to each HI school for distribution to their students during the intervention. At one HI school the helmets were distributed at the assembly. In the other two schools the helmets were distributed as part of the classroom reinforcement session. After the post-intervention survey had been conducted, the LI intervention schools were provided with sixty free helmets apiece to give away to a random



**Jacques Demers, head coach of the Detroit Red Wings professional hockey team, speaking to the students about the importance of wearing a bicycle helmet.**

selection of students. This provided an incentive for schools to agree to participate as a LI school. Letters to the parents, urging them to make sure the helmets were worn, were included in the boxes of all the helmets that were given away (see Appendix F). In both the HI and LI schools the process of selecting the students to receive the helmets was left up to the principal. It was, however, strongly recommended that the schools make an effort to include student leadership and economic ability as variables in the final formula used in their distribution plan. In at least two of the three HI schools, students were asked to sign up if they wanted to receive a helmet. Also, at the HI schools, the school coordinator was provided with reflective wrist bands autographed by the Red Wings coach or player to be given out as a reward to students "caught" wearing their bicycle helmet when riding to school.

Cost: Helmets - avg. $14.92@

**Teacher's supplement.** A curriculum guide was developed for distribution to the twenty-one teachers who volunteered to lead a discussion of helmet use in their classroom (see Appendix G). The format of the guide was based on the general modules developed for the Michigan Model. Since many of the teachers were familiar with this format, it was believed that receptivity of the curriculum guide would be enhanced. The guide built on a major theme of the sixth and seventh grade components of the Michigan Model curriculum--taking charge of one's health. It was felt that building on this theme would increase teacher participation and make it easier to integrate the session into the existing curriculum. In addition, the theme of taking charge of one's own health was considered to be important in developing the motivation for students to wear helmets.

Included in the bicycle helmet curriculum guide were facts concerning bicycles and head injury, reasons helmets are not worn by children, and an actual lesson plan. The lesson plan emphasized the consequences of brain injury, explored the students' own reasons for not wearing a helmet, and highlighted the fact that wearing helmets is the "smart" thing to do. The curriculum guide provided alternative class exercises which allowed flexibility for the teacher and allowed them to judge the best approach for their particular students. Teachers were also provided with two PSA videotapes, which they could use at their discretion to support themes in the curriculum guide. Most teachers reported that the classroom discussions lasted between fifteen and thirty minutes.

## Program Coordination

**At MDPH.** Previous projects had emphasized the need for a person whose total energy could be dedicated to intensive supervision and coordination of the bicycle helmet promotion project.[41,43] Therefore, a full-time project director was hired to coordinate the project at MDPH. The project director's tasks for the Michigan Bicycle Helmet Project included: 1) design and development of all components of the school-based interventions, including writing all educational materials, overseeing the creation and production of the PSA, and working with outside agencies when external expertise was needed in designing an element of an intervention component; 2) implementation and coordination of all phases of the school-based interventions; 3) responsibility for the activities of all contractual arrangements associated with all facets of the Michigan Bicycle Helmet

Project; 4) assisting in all post-intervention evaluations and analyses; 5) providing ongoing staff support and coordination of activities for the Michigan Bicycle Helmet Advisory Committee; and 6) providing consultation to local health departments, Michigan Model coordinators, and any other groups from Michigan or any other areas regarding bicycle helmet promotion.

**In the schools.** Coordinator teachers were identified in each of the HI schools. They were briefed on the project by the project's principle investigator, and presented with a briefing paper laying out their required tasks. These tasks included: 1) coordination of the assembly; 2) dissemination of information to the other teachers for classroom reinforcement presentations; 3) remaining in communication with MDPH; 4) trouble-shooting and referring any problems or potential problems to the primary investigator at MDPH; 5) assuring that posters were hung prior to assembly day; 6) assisting in publicity of the assembly; and 7) giving a peptalk and performing the introductions at the assembly. In the LI schools the principals acted as coordinators and also briefed their faculty on the classroom presentations. Principals in each of the schools oversaw the mailing of the brochures and coupons to all the parents.

**In the Oakland County Health Department (OCHD).** Involvement of the local county health department in the project was crucial. The OCHD assigned a health educator and a program administrator to the project. This gave the project a local base and provided personnel within easy driving distance of the intervention sites for delivery of program materials and assistance in handling any problems which arose. The OCHD was also the subcontractor for the purchase and delivery of the almost 800 bicycle helmets distributed in the project.

## Pre- and post-intervention surveys

To evaluate change in bicycle helmet usage by the students, as well as changes in parental awareness of the need for bicycle helmets, two point-in-time telephone surveys were conducted. One week pre- and three to four weeks post-intervention, random samples of students' parents from each of the intervention schools were polled. The total sample sizes for the pre- and post-intervention were 427 and 414 households, respectively (see Appendix H for breakdown of sample by school and intervention intensity). This was sufficient to report results at the 95% level of confidence. Before the surveys were conducted, the questions (see Appendix I) were pre-tested with a small phone sample of parents of middle school students to examine ease of administration and clarity of the items. Several of the questions had been used previously in a statewide survey designed to determine the prevalence of bicycle helmet use in Michigan.[c] Both the pre- and post-intervention surveys contained questions concerning bicycle riding frequency, helmet use patterns, parental attitudes toward helmets, and bicycle related injuries requiring medical

[c] In 1989, 25% of the households surveyed for the statewide study had children between the ages of 5 and 14 who rode a bicycle, thus providing statewide baseline data on bicycling and helmet use behavior for a large segment of Michigan's young people. In addition, almost half (47%) of those children were in the 10-14 year old age group, thus providing representative baseline data against which the Oakland County students could be directly compared.

treatment. The post-intervention survey also included questions concerning the parents' and students' exposure to the intervention.
The schools, in order to participate in the project, had to provide a roster list of phone numbers--without identifying names or addresses--of their students. These lists were then used as the sampling frame. These lists were not all-inclusive because they did not include unlisted phone numbers and some households did not have telephones. The surveys were conducted by the staff of the Kercher Center for Social Research at Western Michigan University, using a Computer Assisted Telephone Interviewing (CATI) system. The data were analyzed at MDPH using chi-square on SPSS-PC+.[44]

Total cost for data collection: $10,000.00

## Advisory Committee

In the initial stages of the project, it was determined that community involvement was a critical element which would contribute to the success of this program and to the probability that a bicycle helmet program would continue in Oakland County. For participation on an advisory committee, project staff sought to identify community residents with one or more of the following attributes: expertise and interest in reducing head injury; interest and involvement in bicycling and bicycle safety; experience in community coalition building; experience in childhood injury prevention; and/or a background in public health education.

The Advisory Committee members[d] provided advice and support for the program throughout the project. Among their many tasks, they assisted in obtaining the cooperation of the schools; reviewed and evaluated the program's concept and educational materials; participated in the assemblies; provided assistance in the production of the PSA and support in obtaining air-time for the PSA; and provided critical review of the survey analysis and program evaluation. Lastly, committee members have expressed a desire to remain actively involved in efforts to build a program to promote bicycle helmet use throughout the state.

[d] A list of Advisory Committee members and their affiliations can be found in the preface.

*"Cutting through all their arguements, children and young people (as well as older ones) who ride bicycles are better protected from head injury by wearing helmets. How do we get them to wear them?*

*Hugh D. Allen, M.D.*
*Columbus, Ohio*

## EVALUATION OF THE PILOT PROGRAM

**Student's bicycle riding behavior.** In both the pre- and post-intervention surveys, 100% of the households selected contained at least one child between the ages of 10 and 14 who rode a bicycle at least occasionally. Fifty-seven percent of the young people were frequent riders (5+ times/wk) and another 28% rode often (2 - 4 times/wk) during the bicycling season (see Table 4). Males tended to ride more often than females. These levels of ridership were somewhat higher than those found in the statewide survey (see Table 5). Of the 1,240 early adolescents in this study about whom parents reported bicycle riding frequency, twelve (1%) did not ride a bicycle. When the following discussion concerns student riders on an individual and not household basis, only the 1,228 youths who rode a bicycle at least occasionally are included.

**Recruitment of Schools.** Recruiting schools to participate in the program was much more difficult and time consuming than anticipated. The unwillingness of schools to participate

**Table 4. Reported frequency of bicycle riding by 10-14 year olds in surveyed households.**

| *frequency of riding* | *all* (n=1,246) | *boys* (n=636) | *girls* (n=610) |
|---|---|---|---|
| | ----------% | | ---------- |
| ≥ 5 times/week | 57% | 69% | 45% |
| 2-4 times/week | 28% | 21% | 37% |
| once a week | 8% | 6% | 9% |
| < once a week | 6% | 3% | 9% |
| doesn't ride | 1% | 1% | 1% |
| unknown | 0.5% | 0.3% | 0.7% |

**Table 5. Reported frequency of bicycle riding of 10-14 year olds in surveyed households from statewide sample.**

| *frequency of riding* | *all* (n=457) | *boys* (n=242) | *girls* (n=215) |
|---|---|---|---|
| | ----------%---------- | | |
| ≥ 5 times/week | 44% | 54% | 33% |
| 2-4 times/week | 32% | 29% | 35% |
| once a week | 11% | 7% | 15% |
| < once a week | 11% | 6% | 15% |
| doesn't ride | 2% | 3% | 1% |
| unknown | 0.7% | 1% | 0% |

in the project was unexpected. The biggest barrier to participation for many schools was the requirement that they provide home phone numbers of their students for use in the pre- and post-intervention telephone surveys. In several instances, positive initial contacts were made with district and school administrators, but after numerous follow-up contacts several schools ultimately rejected the program because they were unwilling or unable to provide the required phone numbers. In some school districts superintendents said that either all their schools had to be involved or none of them could be considered. In other cases, individual schools did not want to participate because of their "crowded curriculum" and limited class time. The list of potential schools was further narrowed by the desire for a rural/suburban/urban mix. Lastly, some schools were eliminated because their per capita student expenditure was higher than 1 standard deviation above the mean.

Given the above difficulties in obtaining school involvement and the stratification limitations, the choice of the participating schools could not be random. Although random selection and assignment are desired to avoid biases inherent in self-selection, it was not feasible in this study. One possible effect on the outcome of the study is that in some cases faculty and/or administrators of the self-selected schools might have been more involved in and enthusiastic about the program than those at a randomly selected school. This fact could have caused an increase in helmet use among the student body that could not be duplicated in the average middle school in Michigan. However, in the "real world" it is not likely that such an intervention program could occur successfully without the cooperation of a school, therefore the findings may reflect what would happen when the program is replicated.

**Assignment of high- and low-intensity schools**. The assignment of each of the schools to the high or low intensity intervention protocol was only random in one instance, where a coin toss was used. Random assignment was not possible because some schools did not feel they could devote the time required for a full school assembly close to the end of the school year. In all cases, the administrators and faculty knew in advance whether their school was a high or low intensity site, which again might have had an impact on the level of their individual voluntary involvement and visible enthusiasm.

**PSA**. A professionally produced PSA can be a costly venture. In the case of "Keep on Winning" the expense was controlled by using the facilities and staff of a production company located within the communication department of a local university. This company uses professionally trained students supervised by university faculty and professionals at the public broadcasting station located on campus. The final product was of professional quality and well received by health education professionals, members of the Michigan Bicycle Helmet Project Advisory Committee, and a test audience.

Unfortunately, it was not possible to determine how often, at what times, or even if, the PSA was aired on any particular TV station to which it was distributed. Commercial stations are generally not willing to provide "airing" information or to open log books for review, and funding was not available to obtain the services of an organization which monitors commercial advertisements and public service announcements.

It was thought that the impact of the PSA could be assessed by questioning callers who requested additional information on bicycle helmets by phoning the 1-800- health hotline number at MDPH.[•] Over the course of the intervention, only one call for information was received by the hotline, even though the phone number also appeared on the back cover of the brochures which were distributed. It is impossible to determine the reason(s) for this level of response. It may reflect disinterest in the topic of bicycle helmets, reluctance to phone a 1-800- number if parents were not home, or possibly a lack of attention to the number.

**Parents' brochure**. Education of the parents is a vital component of any childhood injury prevention campaign. With bicycle helmet usage, parents in most instances have the opportunity to establish household rules concerning helmet use, reward their children for positive usage behavior, act as a role model if they themselves ride bicycles, and provide the means of purchasing the helmets.

The one component of this pilot school-based intervention aimed directly at the parents was the brochure mailed to them by the schools accompanied by the three helmet discount coupons and the principal's endorsement letter. Of the 414 parents interviewed during the post-intervention survey, 159 (38%) recalled receiving the brochure in the mail. As a group, parents of children in HI schools were significantly more likely to report receiving the brochure than parents of LI school students ($p < 0.0005$). However, reported receipt

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[•] The questionnaire developed for use with callers to the hotline is available from the Michigan Bicycle Helmet Advisory Committee upon request.

varied widely by individual school, ranging from 6% to 54% in the LI schools and from 12% to 68% in the HI schools. Additionally, 80% (n=204) of those parents surveyed at post-intervention who did not recall receiving the brochure had no children who owned a bicycle helmet, either purchased or free (p=0.018).

This diverse and relatively low level of recognition might either be a reflection of the parents' varying perceptions of the importance of mailings from the school and/or of their child[ren]'s level of enthusiasm for the program. If a child was excited about the program they might have been more likely to talk about it at home, thereby reinforcing the parent's awareness of it. Additionally, parental awareness might have been higher if a the child already owned a helmet or brought one home from school.

Of those parents who recalled receiving the brochure, 81% (129) reported that they did read it. There was no difference between HI and LI schools on this question. When queried about the importance of each of the five sections of the brochure, the majority of the parents found all the information presented at least "useful" (see Table 6). The least useful or memorable section appears to have been "tips for getting your child to wear a helmet", which appeared on the back page of the brochure. Interestingly, the parents who had read the brochure and discussed the importance of helmets with their children found the section on tips to get the child to wear a helmet more useful than those parents who did not discuss helmet wearing (p=0.033).

**Table 6. How useful parents found each of the five sections of the parents' brochure.** (n=129)

| | | *very useful* | *useful* | *not useful* | *didn't read* | * |
|---|---|---|---|---|---|---|
| | | ----------%---------- | | | | |
| 1. | Reasons to wear a bike helmet | 40 | 46 | 5 | 2 | 8 |
| 2. | Statistics on biking-related injuries | 20 | 63 | 55 | 2 | 10 |
| 3. | What to look for when buying a helmet | 29 | 48 | 7 | 3 | 13 |
| 4. | Where to buy a helmet/ cost | 19 | 55 | 9 | 4 | 13 |
| 5. | Tips for getting child to wear a helmet | 17 | 46 | 15 | 8 | 15 |

* Didn't remember or refused to answer

Parents who remembered receiving the brochure were much more likely to talk with their children about the importance of wearing a helmet than those who did not recall seeing it ($p < 0.000$). Also, those who not only received the brochure, but then read it were more likely than those who received it but did not read it to report discussing the importance of bicycle helmets with their children ($p = 0.017$). Parents of HI school students who had read the brochure were somewhat more likely to discuss helmets with their child[ren] than parents of LI school students who had also read it ($p = 0.034$) (see Table 7).

Four of the nine parents who had purchased a helmet for their child in the month since the intervention remembered reading the brochure. One of those four stated that the information read was very important in their decision. The other three felt it was somewhat important.

There is no empirical way of determining why some parents did not read, or even remember receiving, the brochure, since the post-test survey did not examine this issue. In some instances, a general lack of interest in the topic might have influenced parents to simply ignore the material. In other cases it might have been the source of the message or the design of the materials.

Based upon discussions with school staff, it was determined that the best way to insure that the brochure got into the hands of the parents was through the mail; the students were not seen as reliable delivery sources. In this age of "junk mail" saturation it is necessary to have your material "stand out" and pique the curiosity of the potential reader. The material must have eye-appeal and capture the essence of the issues in a short and readable manner. For these reasons both the style and content of the brochures were pre-tested. The test audiences indicated that the graphic presentation did capture their attention and that the written message was readable and well-organized. However, even though this pre-test indicated that both color and style of the graphics were eye-appealing and attention grabbing, this might not have been the case when the material was blended in with all the other items received in the mail.

**Table 7. Did parents who read the brochure talk with their children about the importance of wearing a bicycle helmet?**

| *talked with children about bicycle helmets* | *Intervention Intensity* | | |
|---|---|---|---|
| | *HI* (n=76) | *LI* (n=53) | |
| | ----------%---------- | | |
| yes | 78 | 60 | |
| no | 22 | 40 | p=0.034 |

By linking the brochure/coupon mailing with a letter from the principal and sending it in a school envelope, it was believed that the mailing would catch the attention of the parents and be provided with a source credibility boost. Where school principals and MDPH fit in the parents' hierarchy of authority is not known, however. That placement may have had some influence on readership. At least one recently released study indicated that the information source parents feel is most authoritative and credible is physicians.[45]

All of these issues deserve further examination if a better understanding of the readership of injury-control consumer-oriented materials and maximization of parental readership of such materials is to occur.

**Student brochure**. When asked, the majority of teachers (89%) who gave classroom presentations and returned an evaluation form (n = 12) found the student brochure helpful in supporting these presentations.

The only other means available for evaluating the immediate impact of the student brochure was parental observations of whether or not their children brought the brochure home and read it. Parents of students in the HI schools were much more likely to report that their children brought helmet materials home from school ($p < 0.000$). Once again, there were wide variations among individual schools within the two intervention levels, ranging from 11% to 73% in the LI schools, and from 40% to 93% in the HI schools. There was no difference between HI and LI schools in the proportion of students reported reading the brochure.

Parents who recalled that their child[ren] brought home bicycle helmet materials from school were more likely to discuss bicycle helmets with their child[ren] than parents who did not remember or whose children did not bring materials home ($p < 0.000$). This relationship existed regardless of intensity of intervention.

**Assemblies**. It was thought that it would be an enticement to the schools to participate if they had the chance of being selected as one of the high intensity schools to receive an assembly featuring two well-known Detroit area professional athletes. However, even this appears to have not been strong enough incentive to overcome the recruiting problems discussed earlier.

Although having professional athletes appearing in person at a school assembly is highly attractive to the students and does capture their attention, it involves enormous scheduling problems. Negotiations with the athletes took place early in the planning and design process, but there were still many unknowns in the players' schedules for later in the year, such as possible post-season commitments. By the time the assemblies were scheduled to take place, the two Red Wings players who appeared in the written materials and the PSA had professional obligations which kept them from participating on the scheduled days. Fortunately, good alternatives from the team were available. Other scheduling difficulties affecting the assemblies involved spring break week for all the schools, and coordination of subcontracting, ordering and delivery of 200 helmets to each school.

Originally, the assemblies were to: a) be a reinforcement of classroom discussions which were to have taken place earlier that same day and b) have included the distribution of the brochures and the helmet giveaway. However, because of class schedules, in all three HI schools the assembly occurred before the classroom discussions. Helmets were given away at the conclusion of one assembly and in the follow-up classroom sessions in the other two schools.

It is difficult to judge how much of an impact the assemblies had on the students, although a thorough evaluation of a component such as this is important because of the time, effort and expense involved in putting them on. Because of the time period between the assemblies and the end of the school year, it was not possible to conduct student surveys to identify student reactions to this or other components of the program. As a consequence, the evaluation of the assembly impact had to be made through proxy assessments--the parental and teacher surveys. Reports from parents as to whether or not they were aware their children had attended the assembly were used as a proxy indicator of whether the assemblies had made an impression on the students. Over half (56%) of the parents of students in the HI schools interviewed after the intervention had taken place were aware that their child[ren] had attended an assembly on bicycle helmets. Whether or not the parent was aware that their child had attended an assembly on bicycle helmets was another factor strongly associated with whether or not the importance of helmets was discussed ($p < 0.000$).

**Students responding to a question posed by one of the assembly speakers.**



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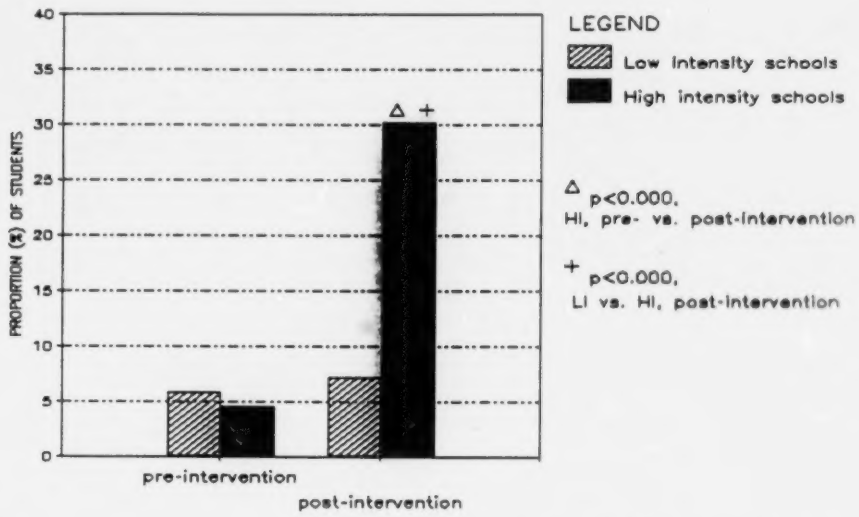
Teachers who did a bicycle helmet segment in their classrooms were asked about their impression of the assemblies. All of the teachers who responded to the evaluation agreed that the content was interesting, informative and important. They also felt that the assembly helped stimulate student discussion on bicycle helmets. Almost 90% of them strongly agreed that it was helpful to have the Red Wings stars as speakers.

**Helmet ownership and use**.[1] As would be expected, due to the large number of helmets which were given away in the HI schools, helmet ownership among bicycle riding students increased over 350% from pre-intervention to post-intervention, from just over 5% of students to 18.5% ($p < 0.001$). Since there was no significant change in ownership reported in the LI schools and only nine parents overall indicated that they had purchased helmets during the month before the post-intervention survey, almost all of this increase was accounted for by the six-fold increase ($p < 0.000$) in helmet ownership by students in the HI schools, due to the helmet giveaways (see Figure 1),

In absolute numbers, there was an increase in overall helmet wearing pre- to post-intervention ($p < 0.001$). There was also a significant difference between the LI and HI

**Figure 1. The proportion of bicycle riding students owning bicycle helmets, low- vs. high-intensity schools.**[1]




[1] Helmet ownership based on parents' reports.

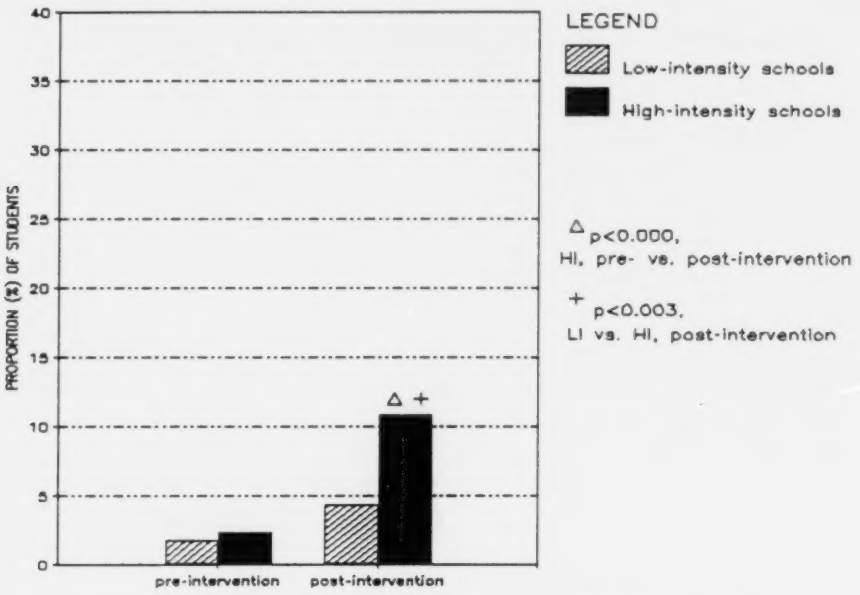
[1] More complex analysis than is presented here would need to be done to establish the influence of various factors, such as parental attitudes and behaviors on helmet ownership and use. The non-independence of multiple-observations from the same household would need to be compensated for by a weighting procedure when investigating the data on the individual children.

schools in the proportion of all bicycle riding students reported by their parents to be wearing a helmet at least 50% of the time at post-intervention ($p < 0.003$) (see Figure 2). However, even though the number of helmet-owning students in the LI schools did not change pre- to post-intervention, the proportion of those students who already owned helmets and wore them at least half the time, increased significantly during the intervention time period ($p < .05$). In contrast, although more students overall were reported wearing helmets in the HI schools than in the LI schools at the time of the post-intervention survey, proportionally fewer helmet-owning students pre- to post-intervention were wearing their helmet at least half the time in the HI schools (see Figure 3).

When asked whether providing free helmets to students had stimulated increased use of helmets by the students, over half of the HI teachers responding to the teacher evaluation questionnaire felt that it had. However, one-third of the teachers felt increased helmet wearing was not something they could assess.

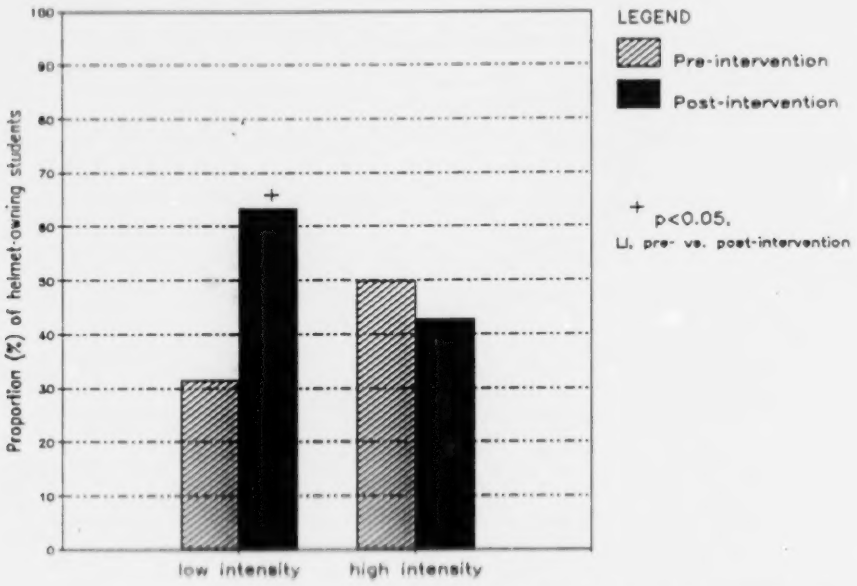
The only observational report of helmet wearing in the post-intervention period was from a county health educator, who described informally observing helmet usage when she visited one of the HI schools a week after the intervention. Although she arrived in the morning when all the students were arriving for classes and she had to stop to let the bicyclists pass in front of her, she reported seeing no student wearing a bicycle helmet. When the principal was asked about this, he stated he had been standing outside every morning since the intervention in order to give away the retro-reflective wings to students

**Figure 2. The proportion of all bicycle riding students wearing a helmet at least 50% of the time, low vs. high intensity schools.[1]**




[1] Frequency of helmet wearing based on parents' reports.

**Figure 3. The proportion of helmet-owning students wearing a bicycle helmet at least 50% of the time, pre- vs. post-intervention.[1]**




[1] Frequency of helmet wearing based on parents' reports.

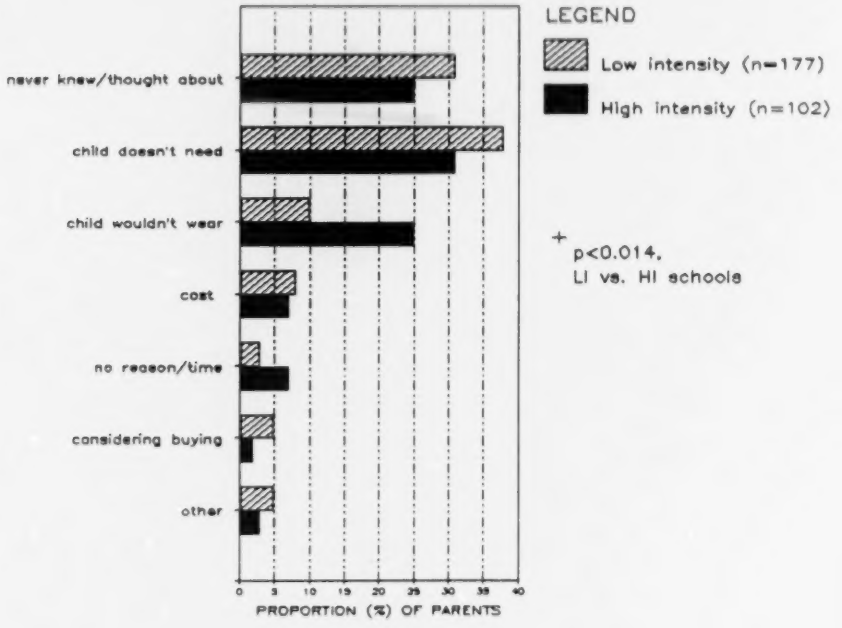
who wore their helmets and up to that time he had not given away one pair. Surveyed parents at this school had reported that 30% of the 10-14 year olds with helmets wore them at least half of the time. It might have been that the students and/or their parents felt that the ride to school was short enough or along a safe enough route that wearing a helmet was not warranted, contrary to the messages presented in the program. In some instances it might also have been that the student did not want to wear a helmet where s/he would be seen by a large number of his or her peers.

This finding strongly suggests the necessity for school follow-up. Both the advertising and educational literature consistently point out the importance of reinforcing messages if behavioral change is to occur. Continuous reinforcement is even more important if the behavior to be changed is habitual in form (efforts to increase safety belt use provide an excellent illustration of this principle). Therefore, it is essential to develop methods of insuring that the message of the importance of wearing a bicycle helmet is reinforced by those who have an ongoing relationship with children--i.e., school staff and parents. Such a process might be achieved by promoting this issue for active support by the school PTA. Continuing parental and teacher involvement in this issue can contribute to this reinforcement process. Such involvement might also lead to the establishment of a requirement that bicycle helmets be worn when riding on school property. While the latter action is fraught with several obstacles--e.g., economics, storage space, liability, etc.--it is here that community coalitions, working in consort with parent-teacher associations, can have an important role in achieving the elimination of such barriers.

In post-intervention households where no child owned a helmet, either purchased or free, the reasons parents gave for not purchasing a helmet differed by the intensity of the intervention in which their child was involved (p=0.014) (see Figure 4). Parents of children in the HI schools were more likely than parents of children in the LI schools to report that their child[ren] would not wear a helmet. It is troubling to see that in the post-intervention survey, almost 40% of the LI parents and over 30% of the HI parents still believed that their child[ren] did not need a bicycle helmet.[9] This is even though over two-thirds of these parents felt it was likely or extremely likely that their child[ren] would receive a head injury if they were involved in a bicycle crash when not wearing a helmet. A logical conclusion from this appears to be that either the parents believe that theirchild[ren] will not ever be involved in a bicycle crash or that the injuries are likely to be minor and therefore do not warrant the purchase of a helmet. These findings strongly point up the need for increasing the emphasis on the frequency and likelihood of severe bicycle-related head injury in future intervention programs.

It was not possible to get information from the helmet companies on how many coupons had been redeemed to purchase a particular brand of helmet. However, the two bicycle stores in Oakland County participating in the Bell helmet discount program reported that

**Figure 4. Reasons parents did not purchase bicycle helmets, by intensity of intervention.[+]**




[9] The category of "child doesn't need a helmet" includes those responses where parents indicated that their child didn't ride on the road or only rode in "safe" places, or their child didn't ride far enough or often enough.

only three or four of those coupons had been used in their stores by the time the coupons had expired at the end of June, just over two months after the intervention.

**Curriculum Guide**. A survey completed a month after the intervention by teachers who conducted classroom discussions indicated that overall the curriculum guide was helpful to them in presenting the information on bicycle helmets to their students.[h] Most of the teachers stated that they spent between fifteen and thirty minutes on the discussion of bicycle helmets. Half of them used at least one of the short videotapes provided, but only a third used the suggested visual aid of dropping a fragile object such as an egg to demonstrate what can happen when a head hits the pavement. Relating helmet use to reducing risk-taking behavior (a unit in the Michigan Model) was felt to be useful by the vast majority of the teachers answering the questionnaire. Over two-thirds of the teachers reported that the students in their classes were "somewhat" interested in the topic of bicycle helmets.

**Intervention Coordination**. Problems associated with the project director's position were among the major obstacles encountered in this particular project. The Michigan Bicycle Helmet Project was hampered because a) a project director was not able to be hired until approximately five months after the project began and then b) due to a serious illness, she had to stop working several months before the actual interventions were to take place and before most of the required materials had been developed and completed. Therefore, her tasks were divided up among the principal investigator and other MDPH and Oakland County Health Department personnel, all of whom were also involved in other projects at the same time. Replacement of the project director was not possible until after the interventions had taken place and school had recessed for the year. Much of the desirable follow-up with the schools, which would have provided such things as verification of intervention activities in the LI schools and the success, or lack thereof, of the retro-reflective wing distribution in the HI schools could not take place due to the lack of personnel. These problems again point up the need for a full-time person who can see the project through from beginning to end.

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[h] Fifty-seven percent (n = 12) of the teachers who gave classroom presentations completed and returned the questionnaire. Because this survey was done one week prior to the end of school, it was not possible to use a follow-up procedures with the others.

*"A child who has a serious head injury is never the same child again. Ever."*

*William Sprunk*
*father of a child brain injured*
*in a bicycle incident*

## CONCLUSIONS

* Bicycle riding is a very common activity among Michigan's young people today. Yet only 2% of them ever wear a helmet when bicycling. Bicycle helmets are one of the most effective sports and recreational head injury prevention devices known today. Therefore, all young people should be strongly encouraged to wear an approved bicycle helmet every time they ride.

* Parents are a major factor in getting their children to wear a bicycle helmet. Many parents are unaware of the need for a helmet or even that such a thing exists. A first step of any bicycle helmet campaign must be simply increasing parents' awareness of bicycle helmets. However, getting the helmet information to them through the schools might not be the best route to take unless the parents regard the school as a significant voice of authority on the issue. In some communities, using physicians as a conduit for information might be more effective.

* Once parents' awareness of the existence of helmets increases, so apparently does their awareness of the cost and their child's reluctance to wear one. Also, after short-term exposure to information on bicycle-related head injuries, a substantial proportion of parents are still not convinced that their child needs a helmet. Intervention programs should perhaps consider addressing the bicycle helmet issue in the following phases: 1) increasing awareness of the existence of helmets; 2) convincing parents and children of the need for a helmet; 3) increasing the accessibility of helmets through discount and giveaway programs; 4) intense education in how to get a child to wear a helmet every time they ride. Phases 3 and 4 would probably be most effective when occurring simultaneously.

* Although the assemblies featuring famous athletes were well received, the lower level of intervention combined with a large-scale helmet giveaway/discount program might be almost as effective as the complete higher intensity intervention. Helmet ownership did not increase significantly in the LI schools, but the proportion of helmet-owning students who were wearing their helmets at least 50% of the time did increase.

* Although this intervention succeeded in achieving a short-term goal in the HI schools of at least 10% of the bicycle riders wearing a helmet at least 50% of the time, previous bicycle helmet intervention programs have demonstrated that long-term, intensive interventions are necessary to substantially and permanently increase helmet usage. Although schools are the most likely place to initiate such an intervention, the typical school calendars do not overlap a large portion of the state's bicycle riding season. Most schools also have a limited amount of time to devote to such a project. Therefore, it is

necessary to have other elements of the community involved to carry on reinforcement activities outside of the school setting. In Michigan, this could be accomplished both through encouragement and active support of community-based intervention programs.

* Every effort should be made to include an observational component in future helmet intervention programs. Observational evaluations of helmet wearing behavior would most likely give a more unbiased representation of actual behavior, although such studies are costly in terms of time and money. In community-based programs, using trained volunteer observers could assist in keeping down the expense of such as study component.

* What is missing from this evaluation report is input from the group of participants whose behavior was to be changed--the middle school students themselves. Parents and teachers can be useful as proxy respondents reporting observed behavior of children. However, it is necessary to know how all recipients reacted to the materials and presentations. Assuring that all participants have input into the evaluation of a program is be valuable in making changes for use in any future programs.

## RECOMMENDATIONS

The following recommendations for increasing the usage of bicycle helmets by Michigan's young people are based on the findings from this report and prior research conducted in this area.

- It is recommended that a plan be developed for the statewide dissemination of a bicycle helmet program. This program should incorporate the successful elements of the Michigan pilot project with elements of other successful programs and should be community-based.

- It is recommended that MDPH staff, in collaboration with members of the Michigan Bicycle Helmet Advisory Committee, design, conduct and evaluate a training program on community coalition building and the promotion of bicycle helmet use.

- It is recommended that the Bicycle Helmet Advisory Committee and the Michigan Department of Public Health work with the Department of Education, parent-teacher associations, and the Michigan School Principals Association to investigate the feasibility of designing rules which would require students to wear bicycle helmets when riding on school property.

- It is recommended that the schools which participated in the pilot project be revisited in the spring of 1992 and that an assessment of helmet ownership and use be made at that time. This is because the combination of the school calendar, summer vacation, and grant period precluded a long-term follow-up study as part of the original project.

- It is recommended that the Advisory Committee and the Michigan Department of Public Health staff work with schools throughout Michigan to insure that their health

education curriculum contains a focus on head injury prevention and helmet use in sports and recreation. One way that this could be accomplished is through the Michigan Model for School Health Education.

- It is recommended that members of the project staff present the findings from this program to the Michigan State Safety Commission and seek the Commission's counsel and support in promoting the issue of bicycle helmet use on a statewide basis.

- It is recommended that the Michigan Bicycle Helmet Advisory Committee seek recognition as a working sub-committee of the Michigan Spinal Cord/Traumatic Brain Injury Committee, as a means of facilitating the Advisory Committee's work on a statewide bicycle helmet program.

---

*"The most likely means of success is to change the status of the [bicycle helmet] wearer, such that they are regarded as normal, rather than as outcasts ostracized by their peers."*

*Barry J. Elliott,*
*Elliott & Shanahan Research*
*Communication and Research*
*Psychologists*

## REFERENCES


1. U.S. Department of the Interior, National Park Service. 1982-1983 Nationwide Recreation Survey. 1986.

2. Sporting News Publishing Company. "Sports census wrap-up". The Sporting Goods Directory. 1984.

3. Michigan Department of Public Health - Center for Health Promotion. 1989 Michigan Behavior Risk Factor Survey (unpublished data). Lansing, MI, 1990.

4. U.S. Consumer Product Safety Commission. Hazard analyses related to bicycles. July, 1973.

5. Fife D, Davis J, Tate L, Wells JK, Mohan D, Williams A. Fatal injuries to bicyclists: The experience of Dade County, Florida. J Trauma 1983 Aug; 23(8):745-755.

6. Dorsch MM, Woodward AJ, Somers RL. Do bicycle safety helmets reduce severity of head injury in real crashes? Accid Anal & Prev 1987; 19:183-190.

7. Kraus JF, Fife D, Conroy C. Incidence, severity, and outcomes of brain injuries involving bicycles. Am J Public Health 1987; 77:76-78.

8. The National Committee for Injury Prevention and Control. Injury Prevention: Meeting the Challenge (pp. 118-136). New York: Oxford University Press, 1989.

9. Wasserman RC, Waller JA, Monty MJ, Emery AB, Robinson DR. Bicyclists, helmets and head injuries: A rider-based study of helmet use and effectiveness. Am J Public Health 1988; 78(9):1220-1221.

10. Weiss BD. Childhood bicycle injuries - what can we do? Am J Dis Child 1987; 141:135-136.

11. Forester J. Why wear a helmet? Am Bicyclist & Motorcyclist 1985; March:61,70-71.

12. Thompson RS, Rivara FP. A case-control study of the effectiveness of bicycle safety helmets. New Eng J Med 1986; 21:1361-1367.

13. Brown B, Farley C. The pertinance of promoting the use of bicycle helmets for 8 to 12-year old children. Chronic Diseases in Canada 1989 Nov; 10(6):92-94.

14. DiGuiseppi CG, Rivara FP, Koepsell TD, Polissar L. Bicycle helmet use by children: Evaluation of a community-wide helmet campaign. JAMA 1989 Oct; 262(16):2256-2261.

15. Kimel SR, Nagel RW. Bicycle safety knowledge and behavior in school age children. J Fam Practice 1990; 30(6):677-680.

16. Metropolitan Life Foundation and Louis Harris and Associates, Inc. Health: You've Got To Be Taught. An Evaluation of Comprehensive Health Education in American Schools. New York: Louis Harris and Associates, Inc., 1988.

17. McDermott FT. Why pedal cyclists should wear safety helmets. Aust Fam Physician 1984; 13:284-85.

18. Weiss BD. Bicycle helmet use by children. Pediatrics 1986; 77(5):677-679.

19. U.S. Department of Transportation, National Highway Traffic Safety Administration. Fatal Accident Reporting System, 1988. (DOT HS 807 507). Washington, D.C.: U.S. Department of Transportation, 1989.

20. Waller AE, Baker SP, Szocka A. Childhood injury deaths: National analysis and geographic variations. Am J Public Health 1989; 79(3):310-315.

21. Baker SP, Waller AE. Childhood Injury: State-By-State Mortality Facts. Baltimore, MD: The Johns Hopkins Injury Prevention Center, 1989.

22. Michigan State Police. Total traffic accident summary for accidents involving pedalcycles: 1989. Unpublished data, 1990.

23. Anda R, Thar W. Childhood Injuries in Michigan: 1982 Deaths, Hospitalizations and Cost of Hospitalizations. Lansing, MI: Michigan Department of Public Health, 1987.

24. Division of Injury Epidemiology and Control, Center for Environmental Health, CDC. Bicycle-related injuries: Data from the National Electronic Injury Surveillance System. Morbidity and Mortality Weekly Report 1987; 36(17):269-271.

25. Mathieson JG. Gaps in current knowledge of bicycle safety and effects on countermeasures. Bikesafe 86, proceedings of the National Bicycle Safety Conference, Newcastle, Australia, April 30 - May 2, 1986, pp. 53-74. Australia: Federal Department of Transport, Federal Office of Road Safety, 1986.

26. Selbst SM, Alexander D, Ruddy R. Bicycle-related injuries. Am J Dis Child 1987; 141(2):140-144.

27. Geelong Bikeplan Steering Committee. Geelong Bike Plan. Victoria, Australia: Geelong Regional Commission, 1977.

28. Kruse DL, McBeath AA. Bicycle accidents and injuries. Am J Sports Med 1980; 8(5):342-344.

29. Armson CJ, Pollard CW. Child cyclist injuries: A prospective study. Med J Aust 1986; 144:144-146.

30. Craft AW, Shaw DA, Cartlidge NEF. Bicycle injuries in children. Brit Med J 1973; 2:146-147.

31. Lundar T, Nestvold K. Pediatric head injuries caused by traffic accidents - A prospective study with 5-year follow-up. Child's Nerv Syst 1985; 1:24-28.

32. McDermott FT, Klug GL. Head injury predominance: pedal-cyclists vs. motor-cyclists. Med J Aust 1985; 143:232-234.

33. McFarlane JP, Jones JE, Lawson JS. Injuries from bicycle accidents. The problem and recommended strategies for prevention. Aust Paediatr J 1982; 18:253-254.

34. Gronwall D, Wrightson P. Delayed recovery of intellectual function after minor head injury. Lancet 1974; 2:605-609.

35. Kraus JF, Black MA, Hessol N, Ley P, Rokaw W, Sullivan C, Bowers S, Knowlton SB, Marshall L. The incidence of acute brain injury and serious impairment in a defined population. Am J Epidemiol 1984; 119(2):186-201.

36. Rimel RW, Giordani B, Barth JT, Boll TJ, Jane JA. Disability caused by minor head injury. Neurosurgery 1981; 9(3):221-228.

37. Rimel RW, Giordani B, Barth JT, et al. Moderate head injury: completing the clinical spectrum of brain trauma. Neurosurgery 1982; 11:344-351.

38. Michigan State Safety Commission. 1987 Governor's Conference on Traffic Safety. Volume 1: Executive Summary. Lansing, MI: Michigan Department of State, Office of Traffic Safety, 1988.

39. U.S. Department of Health and Human Services. Healthy People 2000: National Health Promotion and Disease Prevention Objectives. Washington, D.C.: Government Printing Office, 1990.

40. Wood T, Milne P. Head injuries to pedal cyclists and the promotion of helmet use in Victoria, Australia. Accid Anal & Prev 1988; 20(3):177-185.

41. Harborview Injury Prevention Center and the Washington State Chapter of the American Academy of Pediatrics. Developing a Children's Bicycle Helmet Safety Program: A Guide for Local Communities. Seattle, WA: Harborview Injury Prevention Center, 1987.

42. Bell R, Drakenberg U. Promoting helmet use in schools: The Swedish experience. Paper presented at the Child Accident Prevention Conference, Stockholm, Sweden, September 21-22, 1989.

43. Bicycle Federation of America. Bicycle Helmet Use Campaign Marketing Study. Tallahassee, Fl: Florida Department of Transportation, 1989.

44. SPSS, Inc. SPSS/PC+ V3.0. Chicago, IL: Author, 1988.

45. Eichelberger M.R., Gotschall C.S., Feely H.B., Harstad P., Bowman L.M. Parental attitudes and knowledge of child safety. Am J Dis Child 1990; 144:714-720.

APPENDIX A

## ABSTRACT

### Impact, Skid and Retention Tests on a Representative Group of Bicycle Helmets to Determine Their Head-Neck Protective Characteristics

Voigt R. Hodgson, Ph.D.
Director, Biomechanics Laboratory
Department of Neurosurgery
Wayne State University, Detroit, Michigan

A group of ten bicycle helmets, representative in size, style, and cost of those which would be suitable to participate in a youth helmet use encouragement program, were evaluated for safety characteristics. This included retention tests, drop impact tests onto flat and curved rigid surfaces, and skid impact tests against a concrete slab mounted at various angles. The helmets included both no-shell and hard shell types, six which met the ANSI Z90.4 Standard, which has a 39.4 inch (1 meter) drop requirement and four which met the Snell Standard, requiring 78.7 (2 meter) drops.

It was found that all retention systems were adequate in strength and stretch characteristics for uniform loading, but that they were easily rotated on the head if loaded unsymmetrically.

A 39.4 (1 m) drop with no protection onto any of four locations on the humanoid head model produced a range of from 70% to >99% risk of serious injury response in the model. Wearing any of the helmets reduced the risk of serious injury to 1% or less for 39.4 (1 m) drops onto either surface and almost all locations.

For 78.7 (2 m) drops there were significant risks of serious head injury for most conditions, although two helmets showed that, on average, the risk could be held to 6%.

The skid tests, utilizing a head-neck instrumented Hybrid III Dummy, concrete slab tilted at several degrees to the dummy head path, high speed cinephotography, and conducted at 6 mph (99.7 km/hr), revealed that there was a significant difference in effect on the head and neck injury potential between the heard and no-shell helmets for 30 and 45 degree angles, but at 60 and 90 degrees there was no significant difference. Both types of helmets produced unique head-neck injury hazards. A clear plastic face shield would help reduce the injury risk of both. Further study is needed to determine more comprehensively which type helmet is most sage, but in the meantime use of either should be encouraged as being much safer than bicycle riding without a helmet.

## ABSTRACT

### Skid Tests on a Select Group of Bicycle Helmets to Determine Their Head-Neck Protective Characteristics

Voigt R. Hodgson, Ph.D.

A select group of bicycle helmets, representative of hard shell, micro-shell and no-shell with either rubber straps or nylon cover models, were subjected to skid-type impacts to smooth and rough concrete inclined at five angles from 30 to 60°. Impact occurred in the range of 6.5-8.5 mph (10.4-13.7 km/hr), the upper limit of which was dictated by risk of damage to the neck transducer in the modified Hybrid III dummy. Two dummy body orientations at impact, both symmetrical to the sagittal plane, were investigated.

Test results predict that hard and micro-shell helmets provide about equal protection from cervical spine injury. The hard and micro-shell helmets tended to slide rather than hang up on impact with concrete. This sliding tendency was the mechanism that reduced the potential for neck injury. Nylon covers on the no-shell helmets were helpful under some conditions in allowing sliding to occur as the cover was stripped off the helmet by friction with the concrete.

Under the test conditions, head injury risks from the standpoint of linear accelerations, were negligible in all cases. Rotational head motion did not approach dangerous levels of combined angular acceleration and angular velocity.

Because of rebounding onto the rubber dummy face after sliding impacts, several methods were used to save the face from abrasive contact with the concrete. A polycarbonate faceguard attached to a micro shell helmet not only saved the dummy face from being abraded, but reduced head-neck injury index measurements. It also assisted in keeping the helmet in place.

Results of this series of tests (and similar previous tests of the unhelmeted dummy), predict that any helmet similar to those used in these tests will protect the brain and neck much better than wearing no helmet.


For a copy of the report of either study, write:


Health Surveillance Section
Center for Health Promotion
Michigan Department of Public Health
P.O. Box 30195
Lansing, MI 48909

## APPENDIX B

Keweenaw
Houghton
Ontonagon
Baraga
Gogebic
Marquette
Iron
Luce
Alger
Schoolcraft
Mackinac
Chippewa
Dickinson
Delta
Menominee
Emmet
Cheboygan
Presque Isle
Charlevoix
Otsego
Montmorency
Alpena
Antrim
Leelanau
Grand Traverse
Kalkaska
Crawford
Oscoda
Alcona
Benzie
Manistee
Wexford
Missaukee
Roscommon
Ogemaw
Iosco
Lake
Osceola
Clare
Gladwin
Arenac
Mason
Huron
Oceana
Newaygo
Mecosta
Isabella
Midland
Bay
Tuscola
Sanilac
Montcalm
Gratiot
Saginaw
Kent
Ottawa
Ionia
Clinton
Shiawassee
Genesee
Lapeer
St Clair
Oakland
Allegan
Barry
Eaton
Ingham
Livingston
Van Buren
Kalamazoo
Calhoun
Jackson
Washtenaw
Cass
St Joseph
Branch
Hillsdale
Lenawee
Monroe
Berrien

ESTIMATED POPULATION BY AGE, RACE, AND SEX, 1988
RESIDENTS OF: OAKLAND COUNTY

| AGE IN YEARS | ALL RACES | | | WHITE | | | BLACK | | | ALL OTHER | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTAL | MALE | FEMALE | TOTAL | MALE | FEMALE | TOTAL | MALE | FEMALE | TOTAL | MALE | FEMALE |
| UNDER 1 | 15483 | 7874 | 7609 | 13775 | 7046 | 6729 | 1215 | 592 | 623 | 493 | 236 | 257 |
| 1- 4 | 58206 | 30057 | 28149 | 52395 | 27099 | 25296 | 4298 | 2192 | 2106 | 1513 | 766 | 747 |
| 5- 9 | 70882 | 36313 | 34569 | 63825 | 32647 | 31178 | 5246 | 2723 | 2523 | 1811 | 943 | 868 |
| 10-14 | 74741 | 38119 | 36622 | 67482 | 34373 | 33109 | 5531 | 2845 | 2686 | 1728 | 901 | 827 |
| 15-19 | 77576 | 39473 | 38103 | 70388 | 35889 | 34499 | 5725 | 2832 | 2893 | 1463 | 752 | 711 |
| 20-24 | 76882 | 38515 | 38367 | 70385 | 35378 | 35007 | 5303 | 2537 | 2766 | 1194 | 600 | 594 |
| 25-29 | 84181 | 41865 | 42316 | 77780 | 38781 | 38999 | 5088 | 2447 | 2641 | 1313 | 637 | 676 |
| 30-34 | 91931 | 45687 | 46244 | 84458 | 42067 | 42391 | 5520 | 2681 | 2839 | 1953 | 939 | 1014 |
| 35-39 | 89795 | 44536 | 45259 | 82173 | 40863 | 41310 | 5356 | 2558 | 2798 | 2266 | 1115 | 1151 |
| 40-44 | 78166 | 38583 | 39583 | 71612 | 35421 | 36191 | 4503 | 2096 | 2407 | 2051 | 1066 | 985 |
| 45-49 | 64186 | 31575 | 32611 | 59225 | 29085 | 30140 | 3473 | 1664 | 1809 | 1488 | 826 | 662 |
| 50-54 | 55528 | 27298 | 28230 | 51787 | 25377 | 26410 | 2782 | 1380 | 1402 | 956 | 538 | 418 |
| 55-59 | 51945 | 25510 | 26435 | 48117 | 24094 | 25023 | 2216 | 1085 | 1131 | 612 | 331 | 281 |
| 60-64 | 46551 | 22327 | 24224 | 44484 | 21360 | 23124 | 1659 | 771 | 888 | 408 | 196 | 212 |
| 65-69 | 38870 | 17742 | 21128 | 37316 | 17066 | 20250 | 1245 | 538 | 707 | 309 | 138 | 171 |
| 70-74 | 30114 | 12819 | 17295 | 28941 | 12343 | 16598 | 934 | 374 | 560 | 239 | 102 | 137 |
| 75-79 | 21502 | 8297 | 13205 | 20704 | 8002 | 12702 | 630 | 231 | 399 | 168 | 64 | 104 |
| 80-84 | 13744 | 4709 | 9035 | 13269 | 4538 | 8731 | 375 | 138 | 237 | 100 | 33 | 67 |
| 85+ | 12195 | 3452 | 8743 | 11829 | 3336 | 8493 | 293 | 103 | 190 | 73 | 13 | 60 |
| TOTAL | 1052475 | 514748 | 537727 | 970945 | 474765 | 496180 | 61392 | 29787 | 31605 | 20138 | 10196 | 9942 |

SOURCE: CENSUS BUREAU 1984 COUNTY POPULATIONS BY AGE, RACE (WHITE,OTHER) AND SEX WERE USED TO GENERATE 1988 POPULATION PROJECTIONS BY ADJUSTING FOR BIRTHS AND DEATHS AND APPLYING AN AGING SCHEME. TO SEPARATE BLACK FROM ALL OTHER RACES, 1970 AND 1980 CENSUS PROPORTIONS OF BLACK RESIDENTS WERE CALCULATED FOR EACH AGE AND SEX GROUP. ESTIMATES OF THE SUBGROUP PROPORTIONS FOR 1984 WERE DERIVED BY EXTRAPOLATION USING THE PROPORTIONS OF BLACK RESIDENTS FOR 1970 AND 1980. FOR 1980 THE MODIFIED RACE DISTRIBUTION PREPARED BY THE CENSUS BUREAU WAS USED. A DETAILED METHODOLOGICAL DESCRIPTION MAY BE OBTAINED UPON REQUEST.

PREPARED BY: STATISTICAL SERVICES SECTION, OFFICE OF THE STATE REGISTRAR AND CENTER FOR HEALTH STATISTICS, MICHIGAN DEPARTMENT OF PUBLIC HEALTH, 3423 N. LOGAN ST., LANSING, MI 48909







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APPENDIX C

## SCHOOL SYSTEM SELECTION CRITERIA

| School District | Economic Base Income/Cap. | Student Pop. | Number Eligible Schools | Rural/ Suburban/ Urban | Mich. Model or OCHD Health Ed. |
|---|---|---|---|---|---|
| Hazel Park | 8,106 | 2,092 | 2 | U | Y |
| Ferndale | 10,082 | 1,939 | 2 | U | Y |
| Madison | 9,165 | 1,088 | 1 | U | Y |
| Brandon | 7,488 | 1,238 | 1 | R | Y |
| Holly | 7,935 | 1,622 | 1 | R | Y |
| Huron Valley | 9,238 | 3,844 | 3 | R | Y |
| Lake Orion | 9,841 | 2,180 | 2 | R | Y |
| *Berkley | 12,540 | 1,837 | 2 | U | Y |
| Pontiac | 6,799 | 5,734 | 5 | U | Y |
| Southfield | 15,105 | 4,043 | 3 | U | Y |
| Clarkston | 13,187 | 2,644 | 2 | S | Y |
| Clarenceville | 13,775 | 814 | 1 | U | Y |
| Waterford | 18,313 | 4,833 | 3 | S | Y |
| Oxford | 8,175 | 1,262 | 1 | R | Y |
| Clawson | 10,469 | 865 | 1 | U | Y |
| Oak Park | 11,789 | 1,393 | 1 | U | Y |
| Royal Oak | 10,636 | 3,317 | 3 | U | Y |
| Walled Lake | 12,396 | 3,801 | 2 | S | Y |
| Rochester | 11,133 | 4,954 | 3 | S | Y |

| School District | Economic Base Income/Cap. | Student Pop. | Number Eligible Schools | Rural/ Suburban/ Urban | Mich. Model or OCHD Health Ed. |
|---|---|---|---|---|---|
| Avondale | 12,742 | 1,063 | 1 | S | Y |
| West Bloomfield | 14,708 | 2,102 | 2 | S | Y |
| Novi | 11,428 | 1,580 | 2 | S | Y |
| *Troy | 12,742 | 4,888 | 4 | S | Y |
| Farmington | 13,266 | 4,482 | 4 | S | Y |
| *South Lyon | 10,619 | 1,699 | 1 | R | Y |
| Lamphere | 10,953 | 976 | 1 | U | Y |
| Birmingham | 21,507 | 3,274 | 4 | S | Y |
| Bloomfield Hills | 23,542 | 2,912 | 3 | S | N |

* School districts participating in the bicycle helmet program

APPENDIX D

**BICYCLE HELMET INTERVENTION PROTOCOL**

HIGH INTENSITY — THEME: "Keep-On-Winning: Use Your Head. Use Your Helmet."

1. Mass Media Exposure
   - One 30 second public service announcement (PSA) was aired on Detroit television stations and cable channels during a two to three week period immediately before the interventions. This PSA featured two members of the Detroit Red Wings professional hockey team promoting bicycle helmet use.
   - Copies of the PSA were made available to teachers for classroom use.
2. Poster
   - Fifty posters, reinforcing the themes in the PSA and student brochure, were made available for broad distribution and display in the schools. The posters featured the Detroit Red Wings players from the PSA.
3. Student Brochure
   - Brochures emphasizing the importance of wearing bicycle helmets from a safety perspective and focusing on the idea of contemporary style were made available for all the students. Members of the Detroit Red Wings appearing in the PSA were featured in the brochure.
4. Parent Brochure
   - Brochures were provided the schools for mailing to all the parents. These brochures focused on the following items:
     - Prevalence of serious head injury related to biking.
     - How a helmet protects against serious head injury.
     - What to look for when purchasing a helmet.
     - Where to purchase helmets, and tips for getting kids to wear bicycle helmets.

5. Discount Coupons - Coupons for three different brands of bicycle helmets, allowing parents to purchase them at a significantly reduced price, were mailed along with the parent bicycle helmet brochure.

6. Free Helmets - Each school was provided with 200 free bicycle helmets for distribution to students. Each helmet box contained a message to the parents reinforcing the idea of keeping the helmet on their children's head and not in the box.

7. Assembly - The coach and a well-known player from the Detroit Red Wings, along with the president of the Michigan Head Injury Alliance, appeared in half hour assemblies at each of the schools promoting bicycle helmet use.

8. Teacher Curriculum Guides - Teachers volunteering to reinforce the promotion concept were provided with a curriculum guide for a bicycle helmet module to be presented in their classrooms. The guide contained ideas for discussion, a lesson plan, and issues and points to emphasize to the class. Teachers were also provided with a copy of the PSA to use in conjunctionwith the guide.

LOW INTENSITY THEME: "Keep A*head* "

1. Poster - Fifty posters, focusing on the theme of keeping ahead in safety and fashion as well as being a leader, were made available for broad distribution and display in the school.

2. Student Brochure - Brochures which complimented the poster theme were made available to all students. The brochures focused on the importance of protecting your head from serious injury, the fact that helmets are stylish and contemporary, and that leaders care about themselves and their safety.

3. Parent Brochure - Brochures were provided to be mailed by the schools to all the parents. These brochures focused on the following items:

- Prevalence of serious head injury related to biking.
- How a helmet protects against serious head injury.
- What to look for when purchasing a helmet.
- Where to purchase helmets, and tips for getting kids to wear bicycle helmets.

4. Discount Coupons
   - Coupons for three different brands of bicycle helmets, allowing parents to purchase them at a significantly reduced price, were mailed to the parents along with the parent bicycle helmet brochure.

5. Teacher Curriculum Guides
   - Teachers volunteering to reinforce the promotion concept were provided with a curriculum guide for a bicycle helmet module to be presented in their classrooms. The guide contained ideas for discussion, a lesson plan, and issues and points to emphasize to the class. Teachers were also provided with a copy of the PSA to use in conjunction with the guide.

6. Free Helmets
   - After the post-test the schools were provided with 60 helmets for distribution to their students. The helmets will be provided free of charge.

# APPENDIX E

STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

## DEPARTMENT OF PUBLIC HEALTH

3423 N. LOGAN/MARTIN L. KING JR., BLVD.
P.O. BOX 30195, LANSING, MICHIGAN 48909

Raj M Wiener, Director
April 2, 1990

Dear Parents:

This bicycle helmet is being provided to your child by the Michigan Department of Public Health in cooperation with the Oakland County Health Division and your child's school. This cooperative effort to provide children with helmets, and families with opportunities to obtain additional helmets at a reduced cost, is part of a program designed to reduce serious head injuries among children in Oakland County.

This helmet meets ANSI (American National Standards Institute) and/or SNELL Memorial Foundation certification. This means that the helmet has been safety-tested and approved by one or both of the major independent testing laboratories for bicycle helmets. Please read the instructions and make sure the appropriate adjustments are made to ensure proper fit. The chin strap is an important part of the helmet and should be properly adjusted and always fastened.

Although, no one expects to fall from a bicycle or to be involved in a crash, it is important to have head protection in case either of these things should happen. In 1987, there were over 3,700 Michigan residents injured seriously enough while bicycling to require some type of hospital care. Over 75% of these injuries occurred to children, and most of them were head injuries. Recent research has shown that <u>wearing</u> a bicycle helmet can reduce your child's risk of serious head injury by 85%. <u>Wearing</u> this helmet is the key - don't let it sit in the box.

Your child's school has shown a high interest in the safety of your child by participating and supporting this project. But, you play an important role, too.

Make your child a <u>winner</u> and help him or her <u>keep on winning</u> by always having your child wear a helmet when bicycling.

Health Surveillance Section
Michigan Department of Public Health

APPENDIX F

# OAKLAND COUNTY BICYCLE HELMET PROGRAM CURRICULUM GUIDE

**HOW VULNERABLE ARE YOUR STUDENTS TO INJURY?**

Injuries exact an enormous toll in terms of the economic costs, the public and private burden of the cost, and the devastating effect on the lives of injured persons and their families. At the turn of the century, communicable diseases were the leading causes of death for children and young adults. Today, more adolescents die as a consequence of injuries than from any other causes. From 1960 through 1981, when mortality declined for all other age groups in the U.S., adolescence was the only age group to show a rise in death rates from injuries. The years of potential life lost* from death due to injury is truly staggering.

**Here Are The Facts.**

- According to a 1988 Centers for Disease Control report, "...injury ranks as one of this nation's most pressing health problems. The monthly toll includes the loss of more than 11,000 lives and the severe and permanent disablement of more than 6,000 people."

- In 1985, injury-caused deaths resulted in more years of potential life lost than the total attributable to cancer and heart disease combined.

- Injury is the primary reason for visits to physicians. One in every eight hospital beds is occupied by an injury victim and injury victims account for one-fourth of the persons who visit emergency rooms.

- In 1985, the Committee on Trauma Research estimated the direct and indirect costs resulting from fatal and non-fatal injuries to be between $75 and $100 billion annually.

- Nationally, and in Michigan, injury is the major contributor to the deaths of children and young adults. Injury causes almost half of the deaths of children aged 1-4, and more than half of the deaths of children aged 5-14.

*The years of potential life lost can be determined by subtracting the average age of all individuals who die from a specific cause, e.g., cancer, injury, etc. from the average age of death for all individuals.

- It is estimated that each year in the United States, 410,000 people sustain brain injuries. While the great majority experience good recovery, approximately 17,600 do not. Of these, over 10,000 have a moderate recovery, 5,000 are left with severe impairment, and 2,000 remain in a permanent vegetative state. Profound disability affects all aspects of the survivor's existence for the rest of their lives and, disrupts, changes, and dominates family life forever.

- Bicycle crashes are an important cause of childhood death and injury. In 1987 over 900 persons died in bicycle-traffic collisions and recent projections by the National Injury Information Clearinghouse indicate that during that same year there were 561,764 "incident treatments" in hospitals for non-fatal injuries related to the use of bicycles. ***Approximately 70 percent of those injured or killed were under the age of 15.***

- Every day in America, one child is killed and 1,000 are seriously injured while bicycling.

- In 1988 there were 32 fatalities and 3,283 bikers pedalcyclists injured in traffic-bicycle related crashes in Michigan. Sixty-three percent of the deaths occurred to children between the ages of 5 and 19 and 71% of the injuries occurred to children in the 1-19 year age group.

- Males in the age groups 5-9 and 10-14 are most likely to be admitted to a hospital for this type of injury.

- Head injury is involved in a high proportion of bicycle crashes and is the cause of the majority (over 75%) of the fatalities. Head trauma also occurs frequently in serious non-fatal bicycling crashes. For the survivors of mild to moderate head injuries the outcome can be profound, disabling and long lasting.

**WHY A BICYCLE HELMET CAMPAIGN?**

Biking is a very popular form of recreation. It is an excellent way to get exercise and develop muscle tone while enjoying the outside. But, there exists a very real potential for head injury.

Frequently those bicyclists whose deaths resulted from serious head injuries did not suffer other life-threatening or potentially disabling injuries. Thus, if bicyclists used helmets, many fatalities and serious head injuries would not occur.

The use of protective helmets has reduced the incidence of serious head injury in many of today's competitive sports. Significant advances have been made in reducing injuries in sports such as football, baseball, lacrosse, downhill skiing and ice hockey

through the adoption of helmets. We most often take for granted the importance of helmets in many sports because we have grown accustomed to their use, and we have seen their benefit. We know there is a clear and present risk when a person can be struck in the head by a 90 mile an hour fast ball or a 100 mile an hour puck or to collide with the ground after being tackled by a 185 pound linebacker. What we fail to recognize is that a fall from a height of just three feet (on to a concrete sidewalk) while traveling at 20 miles an hour can cause serious brain damage and death. Both recreational and competitive sport cyclists have recognized this very real risk and have begun to adopt protective headgear. Helmets are now required in sanctioned races and in outings sponsored by most bicycle clubs.

As cyclists began to observe the benefits of wearing helmets they along with the physician community began to urge the American National Standards Institute (ANSI) to establish standards for bicycle helmets. In 1984 ANSI developed the standard for Protective Headgear for Bicyclists, and the Snell Memorial Foundation developed the Snell Standard for Protective Headgear in Cycling. These standards provided bicycle helmet manufacturers with minimum requirements, provided qualities of bicycle helmets which were on the market and stimulated advances in designs as well as additional testing.

Recently a study conducted by Wayne State University has demonstrated the comparative protective qualities of selected bicycle helmets. And in 1989, a study conducted by the Harborview Injury Prevention Center determined that 80% of the serious head injuries suffered by children in bicycle crashes could be avoided if they wear properly certified helmets.

The fact remains, however, even in light of all of the injury evidence and the test results illustrating the efficacy of bicycle helmets, few of our children wear them. A recent National Adolescent Student Health Survey found that 92% of the surveyed students who rode bicycles never wore a helmet. In Michigan, a 1989 survey determined that the helmet use among bicyclers between 5 and 14 years of age was even lower, less than 2%. The proportion who were reported as wearing their helmets "<u>every time</u> they rode their bike," was even lower.

**<u>What are the Reasons for Low Helmet Use?</u>**

- Parents are not generally aware of the risks of bicycle injuries.

- Studies show that parents don't typically perceive cement or streets as a hazard to their children on bicycles; cars and heavy traffic are more often cited as the "real risk."

- Parents have grown accustomed to children riding their bicycles without using helmets, and as a result bicycle helmets are not seen as necessary for children's normal bike riding.

- Typically, when parents are asked the hypothetical question, "What do you think the medical consequences of a neighbor child's bicycle accident would be?" Parents speak of bruises, skinned knees or broken bones. Almost no one mentions head injury.

- Because of inherent optimism or perhaps risk denial, parents tend to see head injury as temporary or a recoverable injury rather than permanently disabling.

- A major obstacle to wearing bicycle helmets is that a helmet is not perceived as "in" or "cool" by school children. This is also an obstacle to parents even considering the purchase of helmets. For parents, who most often have a misperception of the cost of a bicycle helmet, buying something their children express no desire for simply isn't seen as reasonable.

## A LESSON PLAN: PROMOTING BICYCLE HELMET USE

**LESSON OBJECTIVES**

1. Students will identify there are risks of serious injury in bicycling.

2. Students will be capable of stating the consequences of serious head injury.

3. Students will identify factors which have influenced their decision not to use a helmet, and examine strategies to deal with this barrier to a healthy future.

4. Students will recognize that they can take an active step to promote health, to control what happens to them thus helping them achieve their dreams and future goals.

**LESSON-AT-A-GLANCE**

Students will explore the consequences of serious injury and the personal effect head injury would have on them and their family. Students will provide illustrations of individuals who do wear helmets and discuss the reasons for this behavior. They will examine their own risk taking behavior and understand the responsibility they have for their own personal safety. Lastly, students will understand that protecting their head is under their control; their healthy future can rest in their decision.

**TEACHER PREPARATION**

- Review the lesson
- Preview the "Safe Kids" and "Keep-on-Winning" video tapes and determine if they will effectively illustrate points you wish to emphasize.
- Prepare a display with pictures of individuals wearing helmets.
- Bring an egg in an egg carton to class.

**Introductory note:** In that transition to adulthood, adolescents face many important developmental tasks: gaining autonomy, independence, and mastery as well as separating from their parents as they form their own identities. As all teachers know risk taking is one way to pursue these tasks. It's through experimentation that they gain their identity and independence, test limits, and achieve skill and mastery.

However, given their comparatively limited experience they are not likely to consider and weigh the possible tradeoffs between gain and reward in the risks they choose to take. This lesson is, in part, designed to have them examine the consequences of one tradeoff.

This developmental period is also a time of egocentrism. A time when the adolescent tends to believe that everyone else is preoccupied with their appearance and their behavior. Thus, they are quite naturally concerned with not looking out of place, with being "in". We are therefore faced with the challenge of demonstrating that bicycle helmets are "in", "fit for fashion", and appropriate accessories that "cool," smart people wear.

Finally, adolescence is a time when a person moves from concrete to abstract thinking. However, this is a process, and mastery of abstract thinking takes time and practice. Therefore, it is often difficult for adolescents to consider implications of their actions for their future. When you can't abstract beyond the present it is difficult to anticipate future outcomes. It is hoped that this lesson and your guidance will help your students conceptualize one of the risks they face, challenge them to look at their future and aid them in becoming more aware that they have the power to influence their healthy future.

**PROCEDURE**

**Introduction**

1. Ask some of your students to identify some of their aims, goals or dreams for the future, e.g., what would they like to be doing in 10 years. Write these on the board.

2. Briefly discuss with the class what it will take to accomplish these dreams while emphasizing: an ability to think, an ability to see the world as others see it, an ability to communicate, an ability to be mobile, etc. (all of those physical and mental attributes which are prerequisites to the accomplishments of our goals.)

Write the following on the board:

$$\begin{array}{r} 2 \\ +2 \\ \hline 3 \end{array}$$

"Suppose things just stopped adding up"

Ask your students "What would happen if, from now on, 2 + 2 = 3 for them but, 2 + 2 = 4 for everyone else?" Would it be hard to communicate with others because they saw a different world? What would the consequences be for their future?

4. Ask students if they know a 3 or 4 year old child. Have them briefly identify how their life differs from that 3 or 4 year old child, emphasizing language, problem solving ability, communication ability, and relative freedom of action. Illustrating that a serious head injury could leave them with the mind of a 3 year old.

5. Take an egg and drop it on the floor from a height of about 3 feet (or recall the scene of the melon shattering in the "Safe Kids" video) and emphasize how in a split second an impact to an unprotected head can mess-up what's inside - your brain.

   Suddenly, the yolk and the white of the egg are mixed up and parts that were once organized are now disorganized.

   Refer students back to your previous illustrations - In the wink of an eye a biker's brain could be like the egg and 2 + 2 may add up to 3, the person's communication skills may return to those of a 3 year old. (Discuss how their learning and motor skills could be effected. Compare a head injury - which may cause permanent disability to a broken arm which will heal.)

6. Ask the students, holding the egg carton, why we pack eggs in this manner.

7. Using some of the statistics noted earlier in the introduction emphasize how the data show that your students (more than any other age group) are at risk for this very injury if they ride unprotected.

8. Ask your students how many of them wear bicycle helmets. Ask them, why? If they don't, why not?

9. Either display pictures of recognizable individuals wearing helmets, e.g., athletes, astronauts, jet pilots, construction workers, etc., or ask the students to identify people who wear helmets. Follow this with the following question:

Why do they wear helmets?

Are these individuals smart?

Do you look up to them and what they have accomplished? This exercise should lead in the direction of illustrating how individuals we look up to, some of whom have goals similar to ours, value their health and life and take control over the risks they face to increase the probability of achieving their goals and dreams.

10. Close by emphasizing the following:

We all want power over our future. To have that power we have to have facts so that we can make reasonable decisions about what is best for us.

**You have the Facts:**

Head injuries can and do happen to bikers. Head injuries can mess up your life and your future. Helmets provide you with protection, wearing them allows you to have a measure of control over the risks you face and your future. The power is in your hands. You would hardly call Joe Montana, Wayne Gretski, Alan Trammel, Tom Cruise (in "Top Gun"), or an astronaut a "nerd" for wearing a helmet. They are smart individuals, they value their health , their life, and their future! You should too! Use your head, use a helmet and "You can be a Winner!"

This curriculem guide was prepared by the Center for Health Promotion, Michigan Department of Public Health. Questions and comments should be directed to the Health Survillance Section, MDPH, 3423 N. Logan St., P.O. Box 30195, Lansing, Michigan 48909

## REFERENCES

The following publications were used in the preparation of this curriculum guide:


1. Burke, E. "Safety Standards for Bicycle Helmets." The Physician and Sports Medicine. 1988;16:148-153.

2. Burke, E. and Fritschner, D. Get a Head Start: Head Injuury, Helmets and the Cyclist. United States Cycling Federation. Colorado Springs, Co., 1985,

3. Centers for Disease Control. "Bicycle-related injuries-data from the National Electronic Injury Surveillance System." MMWR. 1987; 36:269-271.

4. Elliott, BJ. "Encouraging Helmet Use: An Australian Perspective." Bicycle Forum 23. Spring/Summer 1989.

5. Harborview Injury Prevention Center. Developing a Children's Bicycle Helmet Safety Program. Harborview Medical Center. Seattle, Washington. November 1987.

6. Michigan Department of State Police. Michigan Traffic Accident Facts 1988. Lansing, Michigan 1989.

7. N.C. Division of Health Services. Maternal and Child Care Section. "Tips for Getting Kids to Wear Bike Helmets." 1988.

8. Peter D. Hart Research Associats. "Key Findings from Focus Gropus in the Maryland Suburbs." National Safe Kids Campaign. Washington, D.C. January 23, 1989.

9. Thompson RS, Rivara FP, Thompson DC. "Prevention of Head Injury by Bicycle Helemts: A Field Study of Efficacy." N. Engl J. Med. 1989; 320:1361-1367.

10. Vince CJ, Lang C., Molloy P., and Northrop D., Preventing Adolescent Injury: Roles for Health Professionals Education Development Center, Inc. Newton, Massachusetts 1989

11. Wasserman RD, et al. "Bicyclists, Helmets and Head Injuries: A Rider-based Study of Helmet Use and Effectiveness." Am J Public Health. 1988; 78:1220-1221.

12. Weiss BD. "Bicycle Helmet Use by Children." Pediatrics. 1986; 77:677-679.

APPENDIX G

**Number of households in the telephone sample (10-14 year olds represented) by middle school, and pre- and post-intervention.**

| *school* | *pre-* | *post-* | *totals* |
|---|---|---|---|
| **low intensity:** | | | |
| School A | 71<br>(112) | 71<br>(118) | 142<br>(230) |
| School B | 73<br>(103) | 70<br>(92) | 143<br>(195) |
| School C | 73<br>(113) | 72<br>(106) | 145<br>(219) |
| LI subtotals | 217<br>(328) | 213<br>(316) | 430<br>(644) |
| **high intensity:** | | | |
| School D | 73<br>(101) | 72<br>(108) | 145<br>(209) |
| School E | 65<br>(97) | 60<br>(100) | 125<br>(197) |
| School F | 72<br>(99) | 69<br>(97) | 141<br>(196) |
| HI subtotals | 210<br>(297) | 201<br>(305) | 411<br>(602) |
| **Totals** | 427<br>(625) | 414<br>(621) | 841<br>(1246) |

APPENDIX H

**Michigan Bicycle Helmet Project**
**POINT-IN-TIME TELEPHONE INTERVIEW SURVEY[i]**

SURVEY NO._____

RESPONDENT ID NO._____ Pre-assigned #

DATE OF INTERVIEW_____

SCHOOL SYSTEM TYPE_____

1. Rural
2. Urban
3. Suburban

[number assigned on basis of respondent's ID#]

Hello, I am _____ calling for the Michigan Department of Public Health. We are doing a study of bicycle related injuries in Southeast Michigan. Your number has been chosen randomly from phone numbers of parents or guardians of school aged children in the area.

Is this ___-____ (phone number)?

[Thank you very much, but I seem to have dialed the wrong number.]

Are you the parent or guardian of the school aged children in the household?

[If yes, continue. If no, ask to speak to the parent or guardian.]

The accuracy of this bicycle study depends upon the participation of all the individuals we phone. We would like to ask you a few questions about your child's or children's bicycle riding practices and all answers will be kept confidential.

[i] Questions added to the post-intervention survey are marked with an asterisk (*).

1. How many children between ages 10 and 14 live in your home?

   _____

2. Do any of these children ride a bicycle?

   1. Yes
   2. No (exit interview)
   3. Don't know (exit interview)
   4. Refused (exit interview)

3. Please tell me the age and sex of each child between the age of 10 and 14.

4. How often does each child ride a bike during biking season?

   1. Five or more days a week
   2. Two to four days a week
   3. Once a week
   4. Less than once a week
   5. Doesn't ride
   6. Don't know
   7. Refused

*5. Within the last month has your child (children) brought home from school any material which discussed bicycle helmets?*

   1. Yes
   2. No
   3. Don't remember
   4. Refused

*6. Did he/she/they read the bicycle helmet material?*

   1. Yes
   2. No
   3. Don't remember
   4. Refused

*7. Do you recall recently receiving a brochure in the mail from you child's school which discussed bicycle helmets?*

   1. Yes
   2. No (go to Q14)
   3. Don't remember (go to Q14)
   4. Refused (go to Q14)

*8. Did you read the brochure on bicycle helmets?*

   1. Yes
   2. No (go to Q14)
   3. Don't remember (go to Q14)
   4. Refused (go to Q14)

*The following questions concern your reaction to the brochure you received in the mail. The brochure had five sections.*

*9. Would you say the statistical information on biking related injuries was*

1. Very useful
2. Useful
3. Not useful
4. Didn't read it
5. Don't remember
6. Refused

*10. Would you say the section on "reasons to wear a bike helmet" was*

1. Very useful
2. Useful
3. Not useful
4. Didn't read it
5. Don't remember
6. Refused

*11. Would you say the section on "what to look for when buying a helmet" was*

1. Very useful
2. Useful
3. Not useful
4. Didn't read it
5. Don't remember
6. Refused

*12. Would you say the section on "where to buy and what helmets cost" was*

1. Very useful
2. Useful
3. Not useful
4. Didn't read it
5. Don't remember
6. Refused

*13. Would you say that the section on "tips for getting your child to wear a bike helmet" was*

1. Very useful
2. Useful
3. Not useful
4. Didn't read it
5. Don't remember
6. Refused

*14. Have you talked with your child (children) about the importance of wearing a bicycle helmet?*

1. Yes
2. No
3. Refused

[Ask question #15 only for the high intensity school parents. Select "6" if one of the other schools.]

*15. Did your child recently attend an assembly at school which dealt with bicycle helmets?*

1. Yes
2. No
3. Child didn't mention it
4. Don't remember
5. Refused
6. Q does not apply to this school

16. Do any of the children own a bicycle helmet?

1. Yes
2. No (go to Q27)
3. Don't know (go to Q27)
4. Refused (go to Q27)
*5. Ordered helmet but have not received it yet*

*17. Was a helmet purchased within the last month?*

1. Yes
2. No, my child/children have had it/them longer than 1 month
3. No, my child/children received it/them free from their school (go to Q22)
4. Don't know (go to Q22)
5. Refused (go to Q22)

*The following questions are concerned with factors which influenced your decision to purchase a helmet for your child (children).*

*18. When making the decision to purchase a helmet, how important was the fact that your child asked for a bike helmet?*

1. Very important
2. Somewhat important
3. Not important
4. He/she did not ask for one
5. Don't know
6. Refused

*19. When making the decision to purchase a helmet, how important was the information you read about bicycle helmets?*

1. Very important
2. Somewhat important
3. Not important
4. Did not read the information
5. Don't know
6. Refused

*20. When making the decision to purchase a helmet, how important was the ability to purchase a helmet at a discount price?*

1. Very important
2. Somewhat important
3. Not important
4. Did not know about the discount
5. Don't know
6. Refused

*21. When making the decision to purchase a helmet, how important was your concern for your child's safety?*

1. Very important
2. Somewhat important
3. Not important
4. Did not think about it
5. Don't know
6. Refused

22. (In households where any of the children own a helmet, ask of each child.)
Does your _____ own a bicycle helmet?

1. Yes (go to Q24)
2. No
3. Don't know (go to Q28)
4. Refused (go to Q28)
*5. Ordered one but have not received it yet* (go to Q24)

23. What is the reason a helmet has not been purchased for your _____?

1. I never thought about it
2. My child doesn't need one
3. My child wouldn't wear it
4. It costs too much
5. Other, please specify
6. Don't know
7. Refused
8. Doesn't ride on road/rides only in private or safe area
9. Doesn't ride bike enough

[NEXT GO TO Q28]

24. Is the helmet owned by your _____ a hard shell or non-shell helmet?

1. A hard shell helmet
2. A non-shell helmet
3. Other
4. Don't know
5. Refused

25. What brand is the helmet owned by your _____?

1. Bell
2. Giro
3. Pro-tec
4. Adura
5. Avenir
6. Kiwi
7. LT
8. Schwinn
9. Specialized
a. Vetta
b. Zephyr
c. Other, please specify
d. Don't know
e. Refused
f. Troxel
g. Monarch
h. Performance
i. Paramount
j. Rhode Gear
k. Brancale
l. Master Lite
m. Siero

26. How often does your _____ wear a helmet when riding a bicycle?

1. Always
2. Most of the time (75% of the time)
3. Half of the time (50% of the time)
4. Occasionally (25% of the time)
5. Never
6. Don't know
7. Refused

[NEXT GO TO Q28]

27. If none of your 10 to 14 year old children own a helmet, what is the reason one has not been purchased?

1. I never thought about it
2. My child doesn't need one
3. My child wouldn't wear it
4. It costs too much
5. Other, please specify
6. Don't know
7. Refused
8. Doesn't ride on road/rides only in private or safe area
9. Doesn't ride bike enough

28. Have any of the children ever suffered an injury while bicycling that required medical treatment?

1. Yes
2. No (go to Q40)
3. Don't know (go to Q40)
4. Refused (go to Q40)

29. Please tell me the age and sex of each child that has suffered an injury while bicycling that required medical treatment.

30. When did each of these injuries take place?

31. Was the injury to your _____ an injury to the head or neck?

1. Head
2. Neck
3. Both head and neck
4. Other (go to Q40)
5. Don't know or don't remember (go to Q40)
6. Refused (go to Q40)

32. Did your _____ suffer a skull fracture?

1. Yes
2. No
3. Don't know or don't remember
4. Refused

33. Did your _____ lose consciousness?

1. Yes
2. No
3. Don't know or don't remember
4. Refused

34. Did your _____ suffer a cut or laceration?

1. Yes
2. No
3. Don't know or don't remember
4. Refused

35. Did the injury to your _____ require hospitalization?

1. Yes
2. No
3. Don't know or don't remember
4. Refused

36. Did this injury to your _____ result in any long term physical or mental problems?

1. Yes
2. No
3. Don't know or don't remember
4. Refused
5. The child died

37. Was your _____ wearing a helmet at the time the injury occured?

1. Yes
2. No (go to Q40)
3. Don't know or don't remember (go to Q40)
4. Refused (go to Q 40)

38. Was the helmet worn by your _____ a hard shell or non-shell helmet?

1. Hard shell helmet
2. Non-shell helmet
3. Other
4. Don't know
5. Refused

39. What brand helmet was worn by your _____?

1. Bell
2. Giro
3. Pro-tec
4. Adura
5. Avenir
6. Kiwi
7. LT
8. Schwinn
9. Specialized
a. Vetta
b. Zephyr
c. Other, please specify
d. Don't know
e. Refused
f. Troxel
g. Monarch
h. Performance
i. Paramount
j. Rhode Gear
k. Brancale
l. Master Lite
m. Siero

40. If one of your children was in a bicycle accident and was not wearing protection (helmet), how likely do you think it is that he/she would injure his/her head?

1. Extremely unlikely
2. Unlikely
3. Neither likely or unlikely
4. Likely
5. Extremely likely
6. Don't know
7. Refused

41. Do you ride a bicycle? (This is only applicable for present behavior. If they say they did ride in past, code "2".)

1. Yes
2. No (go to Q44)
3. Refused (go to Q44)

42. How often do you ride your bicycle?

1. Five or more days a week
2. Two to four days a week
3. Once a week
4. Less than once a week
5. Don't know
6. Refused

43. How often do you wear a bicycle helmet when riding your bicycle?

1. Always
2. Most of the time (75% of the time)
3. Half of the time (50% of the time)
4. Occasionally (25% of the time)
5. Never
6. Don't know
7. Refused

44. How old were you on your last birthday?

_ _ (code age in years)

07 Don't know/not sure
09 Refused

45. What is your race? Would you say

[If person says Hispanic, ask "Do you consider yourself white or black?" If they repeat Hispanic, enter 7.]

1. White
2. Black
3. Asian, Pacific Islander
4. Aleutian, Eskimo, or American Indian
5. Other, please specify
6. Don't know/not sure
7. Refused

46. What is the highest grade or year of school you completed?

1. Eighth grade or less
2. Some high school
3. High school grad or GED certificate
4. Some technical school
5. Technical school grad
6. Some college
7. College grad
8. Post grad or professional degree
9. Refused

47. What is your marital status?

1. Married
2. Divorced
3. Widowed
4. Separated
5. Never married
6. A member of an unmarried couple
7. Refused

48. Which of the following categories best describes your annual household income from all sources?

1. Less than $10,000
2. $10,000 to $15,000 ($14,999)
3. $15,000 to $20,000 ($19,999)
4. $20,000 to $25,000 ($24,999)
5. $25,000 to $35,000 ($34,999)
6. $35,000 to $50,000 ($49,999)
7. over $50,000
8. Don't know
9. Refused

This completes our interview. Thank your for your time. Good bye.

49. Record the type of survey:

1. Pre-intervention survey
2. Post-intervention survey

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# Keep On Winning

Use Your Head
Use Your Helmet

*Joe Kocur, Detroit Red Wings*

Michigan Bicycle Helmet Advisory Committee
Michigan Head Injury Alliance
Michigan Department of Public Health
3423 North Logan Street
Lansing, Michigan 48906
For more information phone 1-800-537-5666



# Keep On Winning

Use Your Head
Use Your Helmet

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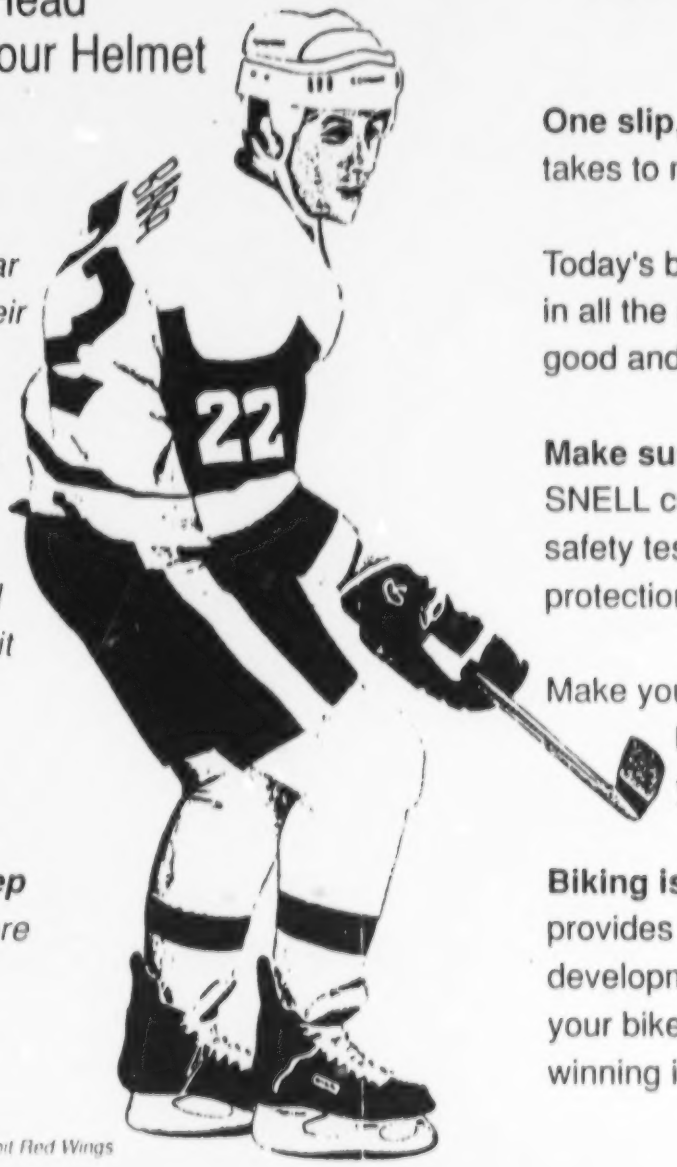
# Keep On Winning

## Use Your Head
## Use Your Helmet

*Many amature and professional athletes wear helmets when playing their sport. They do this to prevent a serious head injury from keeping them away from a sport they love.* ***Joe Kocur*** *and* ***Dave Barr*** *are dedicated athletes who know what it means to protect their heads so they can be winners as Detroit Red Wings. They also know how important it is to* ***keep on winning*** *when they are relaxing - they wear helmets whenever they are enjoying biking.*




Dave Barr, Detroit Red Wings

**One slip, one fall, one crash**, is all that it takes to make your head a loser.

Today's bicycle helmets are **stylish** and come in all the **right colors.** They make you look good and are smart accessories.

**Make sure your helmet** has an ANSI or SNELL certification - that means it has been safety tested to provide your head with protection.

Make your head a winner and keep on winning by **always** wearing your helmet when you ride your bike.

**Biking is fun!** It builds your strength and provides you with good muscle tone and development. Use your head when you're on your bike. By using your helmet you keep on winning in fashion and safety.

# KEEP A HEAD

▶ *Lead the Pack*

▶ *Styled for Safety*

▶ *Fit for Fashion*


Michigan Bicycle Helmet Advisory Committee

Michigan Head Injury Alliance

Michigan Department of Public Health
3423 North Logan Street
Lansing, Michigan 48906

For more information phone 1-800-537-5668


*Use Your Head -*
*Use Your Helmet!*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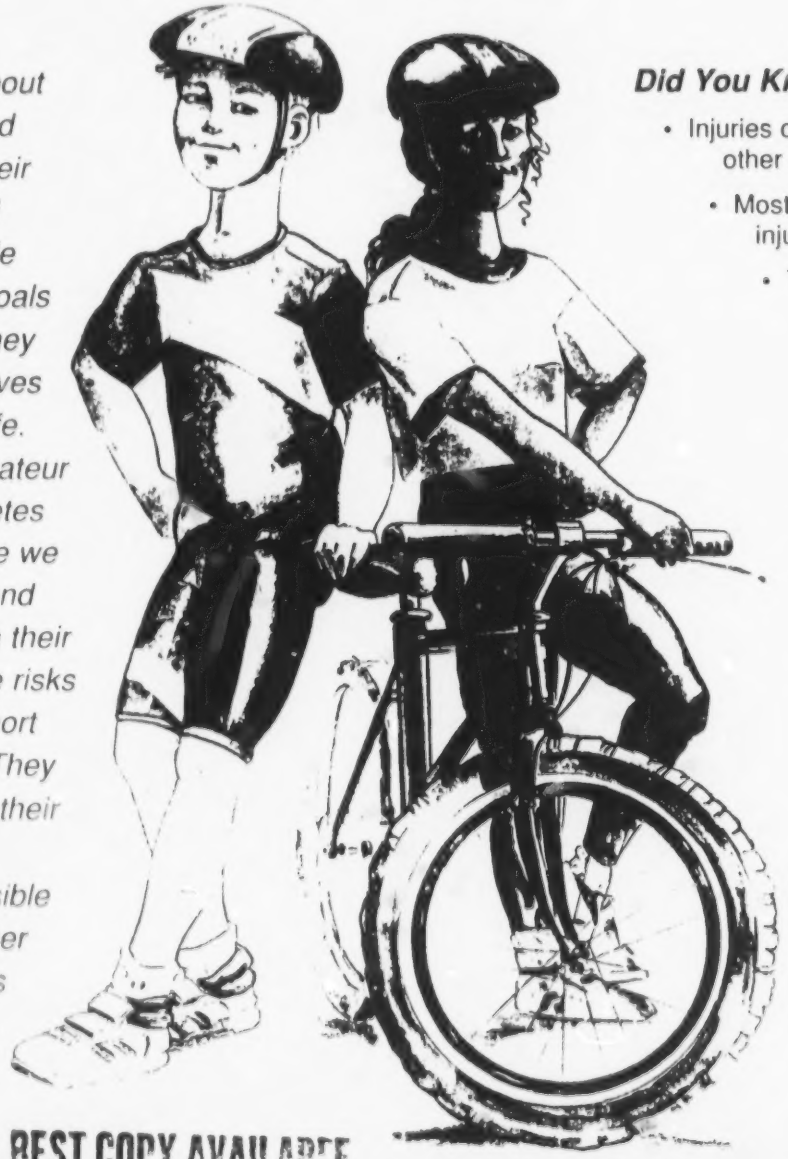
# Get the Bike Helmet Habit

*Think for a minute about people you admire and respect because of their accomplishments and success. These people have achieved their goals through hard work. They have pride in themselves and they value their life. Astronauts, pilots, amateur and professional athletes are often among those we admire and respect, and many wear helmets in their work. They realize the risks they face could cut short their future success. They have taken charge of their future by protecting themselves from possible serious injury. The biker who wears a helmet is also taking charge of his or her future.*



***Did You Know...***

- Injuries cause more deaths of children and teenagers than all other causes combined.
- Most of the serious injuries that happen to bikers are head injuries.
- The majority of the head injuries suffered by bikers in falls and crashes could be prevented if the biker wears a helmet.

## KEEP A *HEAD*

**One slip, one fall, one crash** is all that it takes - in a split second your head could be a loser. So KEEP A *HEAD* in safety by protecting yourself from serious head injury.

Show others you **care about yourself** and your life. KEEP A *HEAD* of the pack - be a leader and take control of your future by wearing a bike helmet whenever you are biking.

Today's bicycle helmets are **stylish** and come in all the **right colors**. So KEEP A *HEAD* in fashion - they make you look good are smart accessories.

**Make sure your helmet** has an ANSI or Snell certification sticker - that means it has been safety tested to provide your head with protection.

**Biking is fun!** It builds your strength and gives you good muscle tone and development. Remember to use your head when biking and use your helmet.



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## *Tips for Getting Your Children to Wear Bike Helmets*

- ***Wear** a helmet yourself.*

  Kids learn best by observing you. Show them you care about yourself and your safety.

- ***Talk** to your kids about why you want them to protect their head.*

  Let them know you love them and you don't want to see them hurt.

- ***Reward** your kids for wearing helmets.*

  Praise them and give them a special treat when they wear them without having to be told to.

- ***Always** have them wear their helmets.*

  Be consistent. If you allow your children to ride occasionally without their helmets, they will not believe your messages about the importance of wearing them.

- ***Habits** form early.*

  Make wearing a helmet a habit early. It will soon become a lifetime habit.

- ***Encourage** your kid's friends to wear helmets.*

  Peer pressure can be used in a positive way if several families in the neighborhood start making helmet use a regular habit.

- ***Remember:***

  Head injuries can occur on sidewalks, driveways, bike paths, parks, and streets. You and your children cannot know when a bike accident might happen. That means it is important to wear a helmet whenever riding - even if its "just down the street."

Michigan Bicycle Helmet Advisory Committee
Michigan Head Injury Alliance
Michigan Department of Public Health
3423 North Logan Street
Lansing, Michigan 48906
For more information phone 1-800-537-5656

*Some material in this brochure was adapted from publications produced by the North Carolina Division of Health Services and the Harborview Injury Prevention and Research Center, Seattle, Washington.*



# *Make Your Kid A Winner*

# A PARENT'S GUIDE TO BICYCLE HELMETS

# Get the Bike Helmet Habit

## Did You Know?

*Seventy-five percent of all biking related injuries that required hospital treatment happened to children.*

*Most (65%)of the biking related deaths in Michigan happen to kids between 5 and 19 years of age.*

*Most (75%)of biking related deaths involve injuries to the head.*

*Death can occur if your head is struck while traveling at as little as 20mph.*

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***No rider ever regrets using a helmet, but crash victims who needed one always regret not wearing one.***



## Why Wear A Bike Helmet?

Wearing a bicycle helmet can reduce a child's risk of serious head injury by 85%.

Helmets absorb the shock of a crash and spread the crash forces over the helmet - not the head.

Helmets that are certified by ANSI and Snell give excellent protection to the head.

Compared to the cost of head injuries, helmets are inexpensive insurance.

## What To Look For

First look for a Snell and/or ANSI certification sticker.* These mean the helmet meets basic safety standards.

Good Fit

- Comfortable
- Snug and doesn't move around the head.
- Should cover the top of the forehead.
- Helmet has limited movement front to back and up and down.
- Strap that is secure and easy to fasten.

Vents to allow for coolness and ventilation.

Bright, light colors for visibility.

## Where To Buy and What Helmets Cost

Good helmets are available in bike shops for $25 to $70 - about the same price as a video game cartridge. A good shop helps you with proper fitting. Try a helmet on for proper fit before you buy. Remember, the price you pay for a helmet is cheap compared to the priceless benefits for your children.

** American National Standards Institute (ANSI) and Snell Memorial Foundation are testing laboratories which have established safety standards for bicycle helmets.*

# KEEP A HEA

**Lead the Pack**

**Styled for Safe**

**Fit for Fa**

*Michigan Bicycle Helmet Advisory Committee* ● *Michigan Head Injury Alliance*

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# Keep On Winning

## Use Your Head
## Use Your Helmet

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JOE KOCUR - D



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